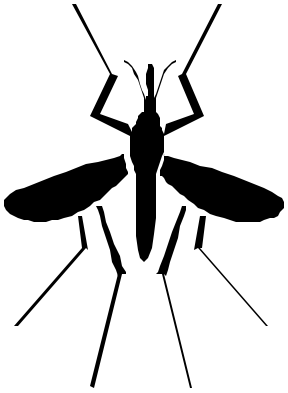
# Arbovirus Surveillance and Mosquito Control in Idaho



## Guidance for Counties

## Version 10.3

**Print Date: 3/14/2003**

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**Purpose of the document**

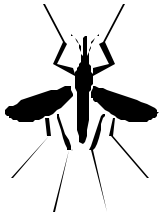
This document will provide a framework that state and local government agencies can use to ensure a coordinated approach to protecting people and animals from WNV in a responsible and thoughtful way.

**Goals of this document**

- Describe West Nile virus
- Provide educational resources to heighten community awareness about WNV
- Explain prevention options for people and for horses
- Describe surveillance activities in Idaho
- Provide information on standard mosquito abatement operations
- Provide a phased-response model for mosquito control when WNV is suspected or found in a community
- Provide guidance for abatement district formation
- Provide some guidance for mosquito control in areas lacking formal mosquito abatement districts
- List state agency contacts and resources

# Table of Contents

## Section 1



**West Nile Virus**

**A.** An introduction to West Nile virus (WNV)

**B.** WNV in humans

**C.** WNV in horses

**D.** WNV in dogs, cats, and other domestic animals

**E.** WNV in birds and other wild species

**F.** Surveillance for WNV in Idaho

# A. An introduction to West Nile virus

## History

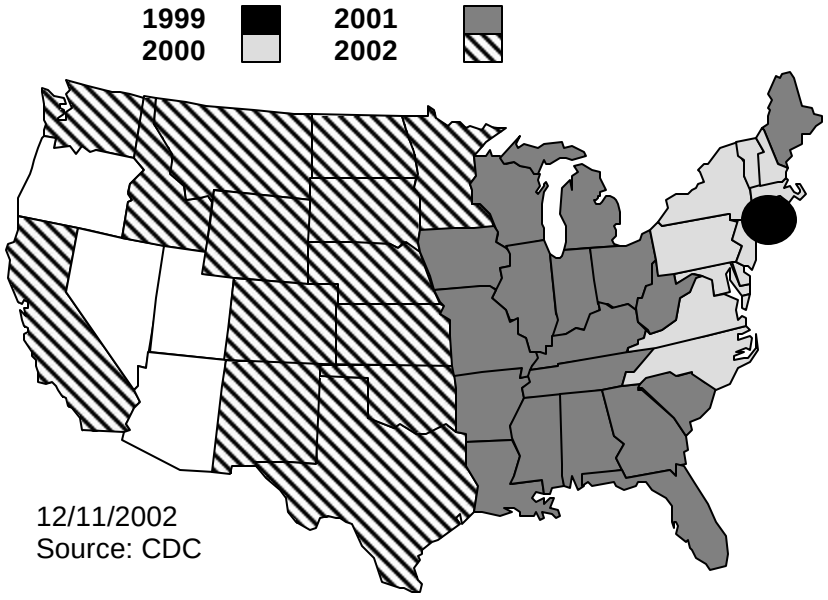
West Nile virus (WNV) was first isolated from an ill adult woman in the West Nile District of Uganda in 1937. The outbreak potential of this virus was not recognized until over 500 affected patients were hospitalized in Israel in 1950. Severe meningoencephalitis (inflammation of brain and membranes surrounding the brain) was first reported in 1957, in Israel. Equine disease was first noted in Egypt and France in the early 1960s. The first appearance of WNV in North America in 1999, with encephalitis reported in humans and horses, and the subsequent spread in the United States is an important milestone in the evolving history of this virus. The outbreak in the U.S. is the largest WNV outbreak ever recorded worldwide with 4,071 severe human cases and 274 deaths (CDC, 2/28/03).

## Geographic Distribution

WNV has been previously described in Africa, Europe, the Middle East, west and central Asia, Oceania and most recently, North America.

Recent outbreaks of WNV encephalitis and meningitis in humans have occurred in Algeria in 1994, Romania in 1996-1997, the Czech Republic in 1997, the Democratic Republic of the Congo in 1998, Russia in 1999, the United States in 1999-2002, and Israel in 2000. Outbreaks of disease in horses occurred in Morocco in 1996, Italy in 1998, the United States in 1999-2002, and France in 2000. Outbreaks occurred in birds in Israel in 1997-2001 and in the United States in 1999-2002.

**New WNV Activity in Humans or Animals by Year -- USA, 1999- 2002**



## B. WNV in humans *(from the Centers for Disease Control and Prevention)*

Approximately 80% of people infected with WNV appear to have no noticeable signs or symptoms. They are considered asymptomatic infections.

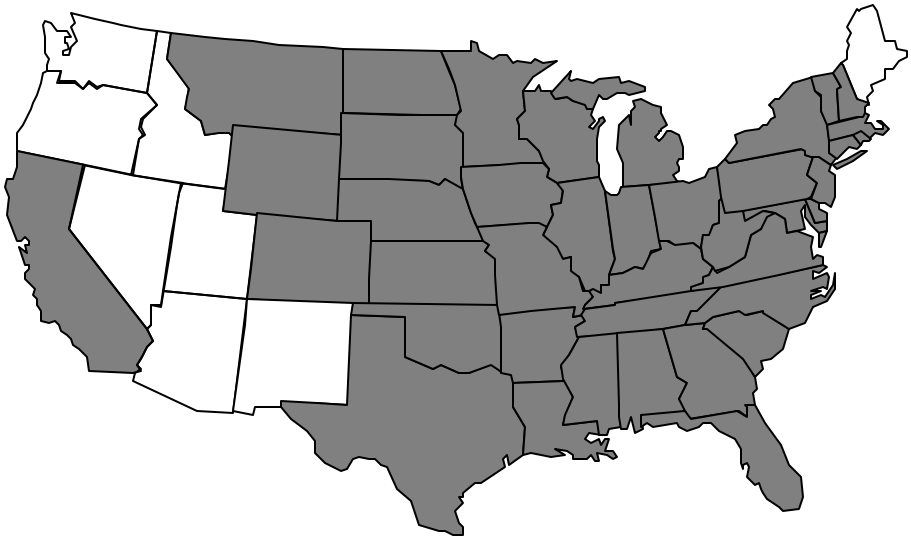
The incubation period in humans (*i.e.*, time from infection to onset of disease symptoms) is usually 3-14 days after the bite of an infected mosquito.

It is estimated that approximately 20% of infected persons will develop West Nile fever. West Nile fever is a mild condition which may include fever, headaches, body aches, and swollen lymph glands. A skin rash on the trunk of the body has been reported on rare occasion. Typically symptoms only last for a few days.

A more severe manifestation is West Nile viral encephalitis or meningitis. Symptoms may include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis. These patients typically require hospitalization. Symptoms of severe disease may last several weeks and neurological (nervous system) effects may be permanent. It is estimated that 1 in 150 persons infected with WNV will develop this form of disease, and a small percentage of those die.

Acute flaccid paralysis, a polio-like illness, has also been described on rare occasion.

## Nationwide Distribution of Locally Acquired Human Cases of WNV--2002



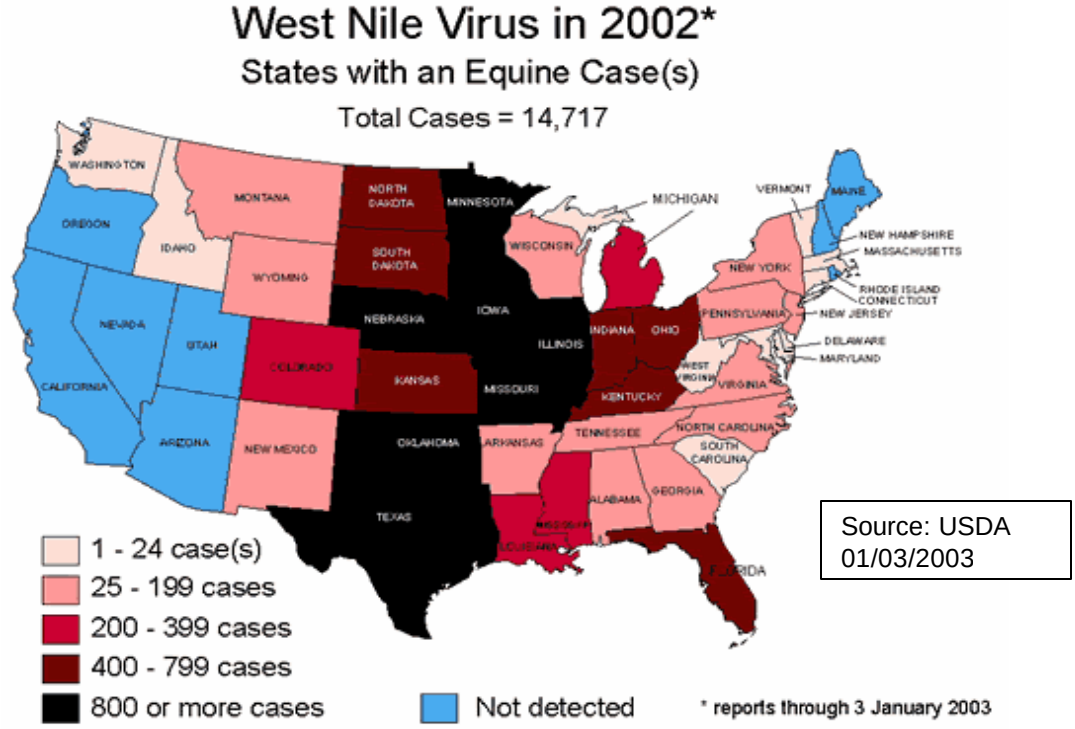
## C. WNV in horses *(from the United States Department of Agriculture)*

Approximately 40% of infected horses may die from a WNV infection. Infected horses may display one or more of the following signs:

- lack of coordination and stumbling
- depression, disorientation, or apprehension
- weakness of the hind limbs, falling down, or an inability to rise
- muscle twitching
- grinding teeth
- excessive sweating and colicky appearance
- fever (detected in less than one-quarter of all confirmed cases)
- hypersensitivity
- blindness
- convulsions
- paralysis
- death

Horses exhibiting any of the signs listed above may be tested for WNV by the Idaho State Department of Agriculture (ISDA). A licensed veterinarian may submit a blood sample for testing.

The WNV vaccine for horses can be obtained only through a licensed veterinarian. Based on laboratory studies, it is effective approximately 94% of the time, which is considered very good. Because the vaccine is not 100% protective, some vaccinated horses may still get WNV because of vaccine failure.



## D. WNV in dogs, cats and other domestic species

*(from the US Geological Survey, National Wildlife Health Center, 12/12/02)*

Dogs and cats are not generally thought to become ill from WNV although some rare exceptions have been documented. They are not believed to be carriers of the virus. There is no vaccine available for pets at the time of this printing. A list of pets and other domestic species that have been found with WNV in the United States is shown below.

### Pets and Other Domestic Species

| | |
|---|---|
| Alpaca | Horse |
| Cat | Llama |
| Chicken | Macaw |
| Cockatiel | Mule |
| Cockatoo | Parakeet |
| Dog | Peacock |
| Donkey | Rabbit, domestic |
| Finch, Zebra | Reindeer (captive) |
| Goat, Mountain | Sheep, Suffolk |
| Goose, domestic | Turkey, domestic |

## E. WNV in birds and other wild species

*(from the US Geological Survey, National Wildlife Health Center, 12/12/02)*

Numerous bird species are susceptible to WNV infection and are listed below. Members of the family Corvidae (*e.g.*, crows, ravens, magpies, jays), and raptors (birds of prey) seem particularly susceptible and develop severe disease or die. As WNV tends to affect birds earlier in the year than humans, tracking deaths in these particular bird populations helps detect virus in a community.

### Native North American Species

Bittern, Least - *Ixobrychus exilis*
Blackbird, Brewer's – *Euphagus cyanocephalus*
Blackbird, Red-winged - *Agelaius phoeniceus*
Blackbird, Rusty - *Euphagus carolinus*
Bluebird, Eastern - *Sialia sialis*
Bufflehead - *Bucephala albeola*
Bobwhite, Northern - *Colinus virginianus*
Canvasback - *Aythya Valisinera*
Cardinal, Northern - *Cardinalis cardinalis*
Catbird, Gray - *Dumetella carolinensis*
Chickadee, Black-capped - *Poecile atricapillus*
Chickadee, Carolina - *Poecile carolinensis*
Cormorant, Double-crested – *Phalacrocorax auritus*
Cowbird, Brown-headed - *Molothrus ater*
Crane, Mississippi Sandhill - *Grus canadensis pulla*
Kite, Swallow-tailed - *Elanoides forficatus*
Magpie, Black-billed - *Pica pica*
Mallard - *Anas platyrhynchos*
Martin, Purple - *Progne subis*
Merganser - *Mergus merganser*
Merlin - *Falco columbarius*
Mockingbird, Northern - *Mimus polyglottos*
Nighthawk, Common - *Chordeiles minor*
Night-Heron, Black-crowned – *Nycticorax nycticorax*
Night-Heron, Yellow-crowned – *Nyctanassa violacea*
Nuthatch, White-breasted - *Sitta carolinensis*
Oriole, Baltimore - *Icterus galbula*
Osprey - *Pandion haliaetus*
Ovenbird - *Seiurus aurocapillus*
Owl, Barn - *Tyto alba*
Owl, Barred - *Strix varia*

Crane, Sandhill - *Grus canadensis*
Crane, Whooping - *Grus americana*
Crow, American - *Corvus brachyrhynchos*
Crow, Fish - *Corvus ossifragus*
Cuckoo, Yellow-billed - *Coccyzus americanus*
Dickcissel - *Spiza americana*
Dove, Mourning - *Zenaida macroura*
Duck, Wood - *Aix sponsa*
Eagle, Bald - *Haliaeetus leucocephalus*
Eagle, Golden - *Aquila chrysaetos*
Egret, Great - *Ardea alba*
Falcon, Prairie - *Falco mexanicus*
Finch, House - *Carpodacus mexicanus*
Finch, Purple - *Carpodacus purpureus*
Flamingo, American - *Phoenicopterus ruber*
Flicker, Northern - *Colaptes auratus*
Flycatcher, Scissor-tailed - *Tyrannus forficatus*
Flycatcher, Traill's - *Empidonax traillii/alnorum*
Goldeneye, Common - *Bucephala clangula*
Goldfinch, American - *Carduelis tristis*
Goose, Canada - *Branta canadensis*
Goose, Emperor - *Chen canagica*
Goose, Snow - *Chen caerulescens*
Goshawk, Northern - *Accipiter gentilis*
Grackle, Boat-tailed - *Quiscalus major*
Grackle, Common - *Quiscalus quiscula*
Grackle, Great-tailed - *Quiscalus mexicanus*
Grebe, Pied-billed - *Podilymbus podiceps*
Ground-Dove, Common – *Columbina passerina*
Grouse, Ruffed - *Bonasa umbellus*
Gull, Great Black-backed - *Larus marinus*
Gull, Herring - *Larus argentatus*
Gull, Laughing - *Larus atricilla*
Gull, Ring-billed - *Larus delawarensis*
Hawk, Broad-winged - *Buteo platypterus*
Hawk, Cooper's - *Accipiter cooperii*
Hawk, Harris' - *Parabuteo unicinctus*
Hawk, Red-shouldered - *Buteo lineatus*
Hawk, Red-tailed - *Buteo jamaicensis*
Hawk, Rough-legged - *Buteo lagopus*
Hawk, Sharp-shinned - *Accipter striatus*
Hawk, Swainson's - *Buteo swainsoni*
Heron, Great Blue - *Ardea herodias*
Heron, Green - *Butorides virescens*
Hummingbird, Ruby-throated – *Archilochus colubris*
Jay, Blue - *Cyanocitta cristata*
Jay, Steller's - *Cyanocitta stelleri*
Kestrel, American - *Falco sparverius*
Killdeer - *Charadrius vociferus*
Kingbird, Eastern - *Tyrannus tyrannus*
Kingfisher, Belted - *Ceryle alcyon*
Kite, Mississippi - *Ictinia mississippiensis*
Owl, Eastern Screech - *Otus asio*
Owl, Great Horned - *Bubo virginianus*
Owl, Northern Saw-whet - *Aegolius acadicus*
Owl, Short-eared - *Asio flammeus*
Owl, Snowy - *Nyctea scandiaca*
Parula, Northern - *Parula americana*
Pelican, American White – *Pelecanus erythrorhynchos*
Phoebe, Eastern - *Sayornis phoebe*
Pigeon, White-crowned - *Columba leucocephala*
Rail, Virginia - *Rallus limicola*
Raven, Common - *Corvus corax*
Robin, American - *Turdus migratorius*
Sanderling - *Calidris alba*
Sapsucker, Yellow-bellied - *Sphyrapicus varius*
Scrub-Jay, Western - *Aphelocoma californica*
Shrike, Loggerhead - *Lanius ludovicianus*
Skimmer, Black - *Rynchops niger*
Sparrow, Fox - *Passerella iliaca*
Sparrow, Savanah - *Passerculus sandwichensis*
Sparrow, Song - *Melospiza melodia*
Swallow, Barn - *Hirundo rustica*
Swan, Tundra - *Cygnus columbianus*
Swift, Chimney - *Chaetura pelagica*
Teal, Cinnamon - *Anas cyanoptera*
Thrasher, Brown - *Toxostoma rufum*
Thrush, Hermit - *Catharus guttatus*
Thrush, Wood - *Hylocichla mustelina*
Titmouse, Tufted - *Baeolophus bicolor*
Towhee, Eastern - *Pipilo erythrophthalmus*
Turkey, Wild - *Meleagris gallopavo*
Turnstone, Ruddy - *Arenaria interpres*
Veery - *Catharus fuscescens*
Vireo, Black-whiskered - *Vireo altiloquus*
Vireo, Warbling - *Vireo gilvus*
Vulture, Black - *Coragyps atratus*
Vulture, Turkey - *Cathartes aura*
Warbler, Blackpoll - *Dendroica caerulescens*
Warbler, Black-throated Blue - *Dendroica striata*
Warbler, Canada - *Wilsonia canadensis*
Warbler, Hooded - *Wilsonia citrina*
Warbler, Kentucky - *Oporornis formosus*
Warbler, Nashville - *Vermivora ruficapilla*
Warbler, Yellow - *Dendroica coronata*
Warbler, Yellow-rumped - *Dendroica aestiva*
Waterthrush, Northern - *Seiurus noveboracensis*
Waxwing, Cedar - *Bombycilla cedrorum*
Wigeon, Eurasian - *Anas penelope*
Woodpecker, Downy - *Picoides pubescens*
Woodpecker, Red-headed – *Melanerpes erythrocephalus*
Wren, Carolina - *Thryothorus ludovicianus*
Wren, Winter - *Troglodytes troglodytes*
Yellowthroat, Common - *Geothlypis trichas*

## Other Free-Ranging Bird Species

Budgerigar - *Melopsittacus undulatus*
Collared-dove, Eurasian - *Streptopelia decaocto*
Dove, Rock (pigeon) - *Columba livia*
Ibis, Scarlet - *Eudocimus ruber*
Lorikeet, Rainbow - *Trichoglossus haematodus*
Pheasant, Ring-necked - *Phasianus colchicus*
Sparrow, House - *Passer domesticus*
Starling, European - *Sturnus vulgaris*
Swan, Mute - *Cygnus olor*

Other wild animal species in which WNV has been detected are listed below.

## Free-Ranging Mammal Species

Bat, Big brown - *Eptesicus fuscus*
Bat, Little brown - *Myotis lucifugus*
Chipmunk, Eastern - *Tamias striatus*
Skunk, Striped - *Mephitis mephitis*
Squirrel, Gray - *Sciurus carolinensis*

## Exotic and Zoo Species

Alligator
Bat, Fruit
Bustard
Condor, Andean
Cormorant, Guanay
Crane, West African Crowned
Duck, Bronze-winged
Duck, Yellowbilled
Emu
Flamingo, Chilean
Goldfinch, European
Goose, Nene
Goose, Red Breasted
Gull, Silver
Lorikeet, Violet Necked
Lory, Forsten
Ostrich
Owl, Tawny
Parrot, Red-crowned
Peafowl
Penguin
Penguin, Black-footed
Penguin, Humboldt
Pheasant, Himalayan Impeyan
Seagull
Seal, Harbor
Stork, Adjutant
Stork, Saddlebilled
Teal, Puna
Tern, Inca
Tit, Varied
Tragopan, Blythe's
Vulture, Cinereous

## F. Surveillance activities in Idaho

Surveillance is the collection of data from different sources to determine if the virus might be present in a community and to what extent. Because WNV affects many different species, critical surveillance activities are carried out by several agencies and professionals as listed below.

**I. Human surveillance**

Idaho Department of Health and Welfare
District Health Departments
Health care providers

**II. Horse surveillance**

Veterinarians
Idaho State Department of Agriculture
U.S. Department of Agriculture, Boise Office

**III. Dead bird surveillance**

District Health Departments
Idaho Department of Fish and Game
Idaho Department of Health and Welfare

**IV. Mosquito surveillance**

Idaho Department of Fish and Game
Participating Mosquito Abatement Districts
District Health Departments
Idaho Department of Health and Welfare

## I. Human surveillance

Physicians are encouraged to submit samples for WNV testing from patients having clinically compatible signs and symptoms. As of 10/30/02, 29 human samples were tested in Idaho by the Bureau of Laboratories in the Division of Health. One sample tested positive. This individual contracted the illness while traveling to the eastern U.S. and has since recovered. The rest of the samples tested negative.

The Idaho Department of Health and Welfare (IDHW) provides educational materials to encourage physicians to consider WNV in patients with aseptic encephalitis (an infection of the brain) or meningitis (an infection of the tissues surrounding the brain). The department has published several WNV-related newsletters for physicians since 2000. These can be found on the IDHW website as noted below.

October 2000:
http://www2.state.id.us/dhw/cdp/bulletin/db10-00.htm
October 2001:
http://www2.state.id.us/dhw/cdp/bulletin/disease_bulletin_oct_2001.pdf
August 2002:
http://www2.state.id.us/dhw/cdp/bulletin/disease_bulletin_aug_2002.pdf

Other resources to encourage human surveillance include an article in the August 6, 2002 edition of the Annals of Internal Medicine, “WNV: A Primer for the Clinician,” and the following websites:

IDHW: http://www2.state.id.us/dhw/cdp/westnile/west_nile_index.htm
CDC: http://www.cdc.gov/ncidod/dvbid/westnile/index.htm

The Idaho State Department of Health and Welfare, Bureau of Laboratories is equipped to test for WNV or antibodies against WNV. Physicians may submit samples to the Bureau of Laboratories, after consultation, to the following address:

Idaho State Department of Health and Welfare
Bureau of Laboratories, Virology Section
2220 Old Penitentiary Rd.
Boise, ID 83712

Contact the Virology section at 208-334-2235 x 228 before sending samples for testing.

## II. Horse surveillance

The Idaho State Department of Agriculture has encouraged veterinarians to submit samples for WNV tests from any horse showing signs of neurologic illness. The ISDA website, http://www.agri.state.id.us/, has information about WNV and horses, as well as a WNV case investigation form. Equine samples may be sent to the Idaho State Department of Agriculture, Animal Industries Laboratory in Boise, Idaho; the U.S. Department of Agriculture National Veterinary Services Laboratory (NVSL) in Ames, Iowa; or the Washington State University Animal Disease Diagnostic Laboratory in Pullman, WA for testing for a fee. The Idaho State Department of Agriculture is capable of testing samples in Idaho with a faster turn-around time. The Idaho Department of Health and Welfare sent a newsletter to veterinarians in 2001 describing WNV illness in horses and encouraging testing and reporting of suspected cases. The newsletter is available at: http://www2.state.id.us/dhw/cdp/bulletin/disease_bulletin_oct_2001.pdf.

The first equine case of WNV disease in Idaho was found to be positive on 10/18/2002 by a private laboratory and confirmed by both the IDHW Bureau of Laboratories and NVSL. The horse did have a travel history out of the state, which may explain the source of infection. Additional surveillance around the equine facility failed to detect any other evidence of WNV. As positive horses have been detected in neighboring states, heightened awareness for WNV by veterinarians and owners alike is encouraged.

To arrange for testing of suspected horse cases in Idaho, contact:

Dr. Kendal Eyre
Idaho State Department of Agriculture
Diagnostic Laboratory
2270 Old Penitentiary Rd.
Boise, ID 83712

Tel: 208-332-8560

## III. Dead bird surveillance

West Nile virus is steadily moving westward. Reports of dead birds and testing of a portion of those dead birds will provide information on the presence of WNV in a community. As with other mosquito-borne viruses, WNV is maintained in a bird-mosquito cycle and transmitted to mammals, including humans and horses, via bites from infected mosquitoes. Members of the family *Corvidae* (*e.g.,* crows, ravens, jays, and magpies) and raptors (birds of prey) appear to be the most sensitive species and experience significant mortality rates. The high mortality, and the ease of identifying these large, conspicuous birds, makes them good early indicators (sentinels) of

disease in a community. If WNV becomes part of the normal ecology of the United States, the utility of dead bird testing for detection of WNV may change.

Appropriate bird species for WNV testing in Idaho are only the corvids (crow, raven, magpie, and jay species), and raptors (eagles, hawks, owls, *etc.*). Concerned citizens are encouraged to contact their district health departments or their local fish and game office to report dead bird sightings. Should the dead birds be corvids or raptors, samples may be collected by these agencies for testing by the Idaho State Department of Health and Welfare, Bureau of Laboratories. In 2002, statewide, over 150 dead birds were reported and 38 birds were submitted for testing. No positive birds were detected.

Gloves should be worn when handling dead birds. Specimens should be double-bagged in plastic as soon as possible and stored in a cool place.

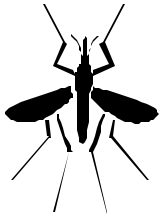
## IV. Mosquito surveillance

Participating mosquito abatement districts and district health departments have carried out (or will initiate in 2003) mosquito collection to determine the species of mosquitoes present in different areas of the state and provide samples (pools) of mosquitoes to the Idaho State Bureau of Laboratories for WNV testing during the mosquito season. (See the section on Standard Operating Procedures for Mosquito Abatement Districts for the rationale behind mosquito surveillance).

By the end of the 2002 surveillance season approximately 200 mosquito pools (from Canyon County) had been examined for mosquito species and tested for WNV. No mosquito pools tested positive.

Mosquito surveillance will be expanding to numerous locations statewide in 2003 to increase the ability to detect the presence of WNV.

## Section 2



## Communication and Public Awareness Activities

**A.** Frequently asked questions about WNV

**B.** WNV Prevention

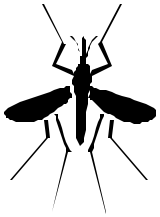
I. Human protection options

II. Equine protection options

**C**. WNV websites and communication strategies

**D**. Educational opportunities

## A. Frequently asked questions about West Nile virus



**Q. What is West Nile virus (WNV) and where did it come from?**

**A.** WNV is a virus that is typically transmitted by the bite of an infected mosquito.

WNV is commonly found in parts of Europe, Asia, the Middle East and Africa. Prior to 1999, WNV had never been found in the Western hemisphere. In the fall of 1999, it was discovered in the greater New York City area. Although it is unclear how the virus was introduced into the United States, it appears to be here to stay. In 2002 the virus had spread north to Maine, into Canada, as far south as Florida and as far west as California and Washington state. Between 1999 and 2001, there were 149 human cases from the eastern United States with 18 deaths. In 2002 alone there have been 4071 confirmed human cases and 274 deaths reported as of 2/28/03. On October 24th, 2002, Idaho became the 44th state in the continental United States to discover the virus when the state public health laboratory confirmed the infection in a horse from southwestern Idaho. Before becoming ill, this horse had traveled to several states in which WNV had been detected, but it was not entirely clear if this horse was infected prior to returning to Idaho or had acquired its infection in Idaho.

**Q. What are the symptoms and treatment of WNV?**

**A.** Although anyone encountering an infected mosquito has a chance of being infected, most infections do not lead to illness. In other words, the infection is asymptomatic. Healthy children and adults have a very low risk of getting sick. If an illness does arise, the most common form is mild and may include a fever and/or headache with complete recovery. This is called West Nile fever. Serious illness can occur in a few individuals, typically those over the age of 50. More severe infections are marked by a rapid onset of a high fever, including head and body aches, disorientation, tremors, convulsions and in the most severe cases, paralysis or death. These severe symptoms are due to encephalitis, an inflammation of the brain; meningitis, an inflammation of the tissues surrounding the brain; or meningoencephalitis, a combination of the two. Usually, symptoms occur from 3 to 14 days after the bite of an infected mosquito. There is no specific treatment for infection, but hospitalization and supportive care may improve the chances for recovery. There is no vaccine available for humans. Another rare manifestation of infection is acute flaccid paralysis, a polio-like syndrome that appeared in a number of cases in 2002.

**Q. How is the virus transmitted?**

**A.** WNV is maintained in nature in a silent transmission cycle between certain mosquito species and certain bird species. Some infected migratory birds, while appearing healthy, can carry the virus into a new area. These infected birds are then bitten by local mosquitoes that, in turn, may transmit the virus to other birds, animals or people. The primary way for a person to become infected with WNV is by the bite of an infected mosquito. Direct person to person or animal to person transmission under normal conditions has not been reported. Bird to bird transmission has been demonstrated under laboratory conditions. Horses and humans are thought to be incapable of transmitting the virus further through a biting mosquito or direct contact; however more research needs to be done in this area.

During the 2002 outbreak in the U.S., some rare human infections occurred through unusual routes; several were attributed to receiving contaminated blood or blood products during transfusion or tissue transplantation, several were laboratory accidents, one infant became infected after nursing from an infected mother, and one infection occurred in a fetus prior to birth.

**Q. Do all mosquitoes transmit WNV?**

**A.** No. Most mosquito species do not transmit WNV. To date, 36 species of mosquitoes have been found to be positive for West Nile virus; however, the ability of each of these species to transmit the virus (vector competency) has not been fully evaluated. Several species of mosquitoes known to be capable of transmitting WNV are found in Idaho. These include *Culex tarsalis, Culex pipiens,* and *Aedes vexans..*

Several other mosquito-borne viruses capable of causing illness in people and animals are already found in western states, including Idaho. They include Western equine encephalomyelitis virus and St. Louis encephalitis virus. Illness from these viruses is very rare.

**Q. How can I protect my family, my animals and myself?**

**A.** Because mosquitoes are the typical source of infection, a simple way to reduce the risk of infection is to reduce the mosquito population around your home, barn, or other nearby structures and to practice some simple precautions to reduce the chance of being bitten by a mosquito. Refer to the next section on prevention options for humans and horses for a detailed list of activities you may consider to protect yourself and your animals from infection.

**Q. What animals can be infected with the WNV?**

**A.** Certain animal species are more prone to illness than others.

***Birds***

The crow, so far, has been the most visibly affected bird in the United States. Crows appear to show signs of illness in a community days to weeks before any human cases have occurred. Because of this, reports of their death (and deaths of other highly susceptible birds, (specifically ravens, magpies, jays, and raptors) may be good indicators that the virus has moved into a community. These birds tend to die singly or in small groups; they typically do not die in large flocks from WNV. Since 1999, more than 50 percent of WNV-positive dead crows evaluated along the East Coast had signs of trauma. It is thought this is because of their inability to fly correctly as the disease progresses.

***Horses***

Horses can become seriously ill if infected. Horses vaccinated against eastern equine encephalitis, western equine encephalitis and Venezuelan equine encephalitis are not protected against WNV. A new equine vaccine against WNV has been developed by Ft. Dodge Animal Health. The vaccine consists of two shots given three weeks apart. The vaccine becomes effective approximately two weeks after the second shot is administered. Contact your equine veterinarian for more information about vaccinating your horse against WNV.

The most common sign of WNV in horses is weakness, usually in the hindquarters. Weakness may be indicated by a widened stance, stumbling, leaning to one side and toe dragging. In extreme cases, paralysis may follow. Fever is sometimes evident, as are depression and fearfulness. Approximately 30 to 40 percent of cases of West Nile viral encephalitis in unvaccinated horses have proven fatal. To date there is no definitive evidence that WNV can be transmitted from horse to horse.

***Other Animals***

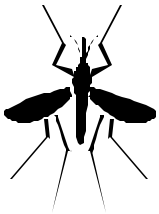
WNV disease has been confirmed in some dogs and cats; however, it has been extremely rare in these species and does not appear to be a serious risk to them. There is no vaccine for dogs or cats. WNV disease in wild mammals is rare. Wild mammals in which evidence of WNV infection was seen and reported include bats, chipmunks, squirrels, rabbits, skunks, deer, mountain goats, and black bear.

**Q. Are outdoor enthusiasts or hunters at higher risk?**

**A.** Outdoor activities may put people at higher risk of WNV infection because of an increased chance of mosquito bites. Following the personal protective measures described in the next section will help reduce the chance of being bitten by a mosquito. Window screens on campers and boats should be kept "bug-tight" as should netting on tents and similar outdoor gear. Keeping a campsite neat and orderly and eliminating any potential mosquito breeding sites in long-term sites is always recommended. Electric "bug zappers" do not help, since these devices attract more mosquitoes than they kill.

Proper cooking kills WNV, so there is no danger in eating properly cooked wild game. The Centers for Disease Control and Prevention (CDC) recommends wearing gloves to prevent blood exposure to bare hands when handling any dead animal.

# B. WNV prevention



## I. Human Protection Options

### What you can do to protect yourself against mosquito bites

### a. Reduce the mosquito population

Mosquitoes lay their eggs in moist areas, and on standing calm water. The eggs produce larva that develop into pupa and remain in the water until the adults emerge from the pupa and fly off. Weeds, tall grass and shrubbery provide an outdoor home for adult mosquitoes. They can enter houses through unscreened windows or doors or broken screens. Many mosquitoes will breed in any container that holds water, such as buckets or discarded tires.

1. Get rid of standing water. Drain or frequently empty buckets, plastic containers, ceramic pots, trashcans, birdbaths, horse troughs, unused swimming pools, and other containers that can serve as breeding sites. Unclog rain and storm gutters.

2. Locate discarded tires, a common place for mosquitoes to breed. Remove tires or empty any accumulated water. If the tires cannot be removed (such as in playground equipment), bore holes in the low points of the tire to allow water to drain out of the tire.

3. Turn over plastic wading pools and wheelbarrows when not in use.

4. Keep swimming pools properly chlorinated and remove standing water from pool covers.

5. Drill holes in the bottom of containers that are left outdoors, so that water can drain.

6. Be aware that spraying lawns with pesticides is relatively ineffective. Reducing tall vegetation (such as tall grass and weeds), around the residence will remove day time adult mosquito harborage areas.

7. If you can't drain the water, then cover containers with fine netting to exclude mosquitoes, or apply mosquito larvicides to standing water if larvae are present.

### b. Avoid mosquito bites

1. Wear long-sleeved shirts, long pants, and socks when you are outside.

2. Avoid spending time outdoors at dusk or dawn when mosquitoes are most active.

3. Use repellents that contain DEET (N-N-diethyl-meta-toluamide). **ALWAYS FOLLOW DIRECTIONS ON THE LABEL.** DEET can be poisonous if overused. For the safety of children 2 to 12 years of age, don't use a repellent containing more than 10% DEET. Ask your doctor or pediatrician about applying repellent to children under the age of two. Mosquito netting can be used to cover baby carriages.

4. Repair holes in window screens and adjust screen doors to be tight-fitting and self-closing.

**What to do if your area is getting sprayed**

To avoid direct exposure to pesticides and reduce the risk of any reactions to pesticides, observe the following recommendations:

- Some individuals are sensitive to pesticides. Persons with asthma or other respiratory conditions are especially encouraged to stay inside during spraying since there is a possibility that spraying could worsen those conditions. Whenever possible, stay indoors during spraying.
- Turn fans and air conditioners off.
- Use soap and water to wash skin, clothing, children's toys, and other items that you might have close contact with that have been exposed to pesticides.
- Anyone experiencing adverse reactions to pesticides should call their doctor or the local poison control.

If you reside within a mosquito abatement district consult your mosquito abatement district for pesticide information.

If you reside outside of an established mosquito abatement district, information on pesticides and mosquito control can be found on the Internet. Several informative sites are listed below:

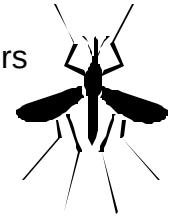
For more information about pesticides and mosquito control, visit the EPA website at http://www.epa.gov/pesticides/factsheets/skeeters.htm.

For detailed information about malathion:
http://www.epa.gov/pesticides/op/malathion.htm

For pesticide information visit Extoxnet: http://ace.ace.orst.edu/info/extoxnet/ or The National Pesticide Information Center at http://npic.orst.edu/

For information about mosquitoes, visit The American Mosquito Control Association (AMCA) http://www.mosquito.org/

For more information about West Nile virus disease, visit the Centers for Disease Control and Prevention (CDC)
http://www.cdc.gov/ncidod/dvbid/westnile/index.htm



Commercial mosquito control operations and licensed professional pesticide applicators may be able to provide additional information specific to your location. You may also contact your local District Health Department, County Agriculture Extension Educator; Idaho State Department of Agriculture, Urban Pesticide Coordinator; or find reference material in your local library.

## II. Equine protection options

### a. Vaccination *(from the United States Department of Agriculture)*

An equine vaccine is available through a licensed veterinarian.

On August 1, 2001, a conditional license was issued for an equine WNV vaccine by the US Department of Agriculture. Conditional licensing means that the product has been shown to be safe, pure, and have a reasonable expectation to prevent illness caused by WNV. In February 2003, the vaccine was granted full licensure. Contact your veterinarian to find out more about using the vaccine. The manufacturer of the vaccine recommends giving two intramuscular doses 3 to 6 weeks apart, followed by an annual booster. The booster should be given just prior to the start of the mosquito season in your area.

Fort Dodge Animal Health produces the vaccine for horses.
See http://www.equinewestnile.com/vaccine.htm

### b. Good health and husbandry practices

Maintain your horse's health by following your veterinarian's recommendations on nutrition, dental care, parasite control, vaccination, *etc*. Poor health and husbandry practices can lower your horse's ability to respond to an infection with WNV.

### c. Standing water reduction

Mosquitoes require standing water to reproduce. By eliminating, reducing, or treating standing water on your property, you will help prevent the mosquito population from growing. Sources of standing water and ways to treat or eliminate them include:

Water troughs and buckets — Scrub troughs to remove algae and replace water at least every three days. Make sure that water drained from the troughs or buckets does not pool and is not left standing.

Clogged gutters and drains — Keep gutters and drains clean; use larvacide briquettes* or equivalent product if standing water cannot be eliminated.

* larvicidal briquettes *are small pellets containing Bacillus thuringiensis israelensis (BTI), that are designed to be placed in water. They kill mosquito larvae for about 7 days and may be purchased in home improvement stores. Be sure to follow directions on the label.*

Old tires — Remove, cut, or treat all old tires on your property - including tire dumps and those used to hold down tarps. Your county mosquito abatement district or the Idaho State Department of Environmental Quality, Waste Management and Remediation Division, may assist you with proper tire management.

Wash stalls and collection drains under wash stalls — Use larvicidal briquettes or equivalent product in collection drains if water collects and stands for more than three days.

Animals should be kept off of pasture areas that are being irrigated — Deep hoof prints may hold enough pooled water to produce mosquitoes and create a hazard that could be avoided.

Any natural water including ponds, brooks, streams, and wetlands — Call your local mosquito abatement district for an assessment. (This service is provided at no charge to district residents.) In all other situations, one should check with the agency with jurisdiction over the waterway. This may involve state and federal agencies and some local agencies in the situation of drainage districts that follow traditional natural drain ways.

Private ponds (artificial ponds) — These ponds must be examined for breeding site potential. These ponds may contain fish and therefore control methods may vary.

Drainage ditches and wastewater lagoons on the farm or storm drains surrounding the farm — Use larvicidal briquettes or equivalent product in ditches on the farm and call your county mosquito abatement agency (if you reside within a mosquito abatement district) regarding storm drains surrounding the property.

Birdbaths — Empty, clean, and replace water weekly.

Wading pools and plastic swimming pools — Chlorinate pools, or clean and replace water weekly.

Standing puddles on ground or in tarps — Try to prevent water from accumulating in puddles. If this is not possible, eliminate the water by sweeping it out or otherwise removing it if it stands for longer than three days.

If you cannot eliminate the water, contact your local mosquito abatement district for recommendations.

**b. Facility management**

Secure barn facility to eliminate bird harborage. One may install fans to disburse carbon dioxide exhaled by the horses and locate incandescent lights away from the barn area to draw mosquitoes away from animal housing areas. Most mosquitoes feed at dawn and dusk; arrange to have horses inside at these times, if possible. This scheduling is especially critical because this period is when horses are most likely to be bitten and infected by mosquitoes. To minimize potential exposure to WNV infected mosquitoes, this schedule should be followed until the first killing frost.

# C. Websites and communication strategies

## I. Websites

### West Nile Virus Information

The Centers for Disease Control and Prevention updates the human case counts, by state, on a daily basis during mosquito transmission season. This site can be found at: http://www.cdc.gov/od/oc/media/wncount.htm

CDC's general West Nile virus site:
http://www.cdc.gov/ncidod/dvbid/westnile/index.htm

The U.S. Department of Agriculture updates their website on a regular basis to reflect reports of WNV infected horses. This site can be found at:
http://www.aphis.usda.gov/lpa/issues/wnv/wnv.html

### Pesticide Information

Environmental Protection Agency (EPA):
http://www.epa.gov/pesticides/factsheets/skeeters.htm.

Idaho State Department of Agriculture - Pesticide Applicator Information:
http://www.agri.state.id.us/agresource/pesttoc.htm

American Mosquito Control Association homepage: http://www.mosquito.org/

Northwest Mosquito and Vector Control Association: http://www.nwmvca.org/

Extoxnet (Extension toxicology network): http://ace.ace.orst.edu/info/extoxnet/

### Idaho Sites

Idaho Department of Health and Welfare West Nile virus website:
http://www2.state.id.us/dhw/cdp/westnile/west_nile_index.htm
Available documents in English and Spanish.
Approximate posting date April 1, 2003:

- WNV Brochure
- WNV Handout
- WNV Poster

Coming soon: "Arbovirus Surveillance and Mosquito Control in Idaho"

Title 39: IDHW statutes regarding mosquito abatement districts:
http://www3.state.id.us/idstat/TOC/39028KTOC.html

Idaho State Department of Agriculture - Animal Health Information:
http://www.agri.state.id.us/animal/wnv.htm

## II. Communication Strategies

The Idaho Department of Health and Welfare, the Idaho State Department of Agriculture, the Idaho Department of Fish and Game, and the Idaho Department of Parks and Recreation all agree that consistent messages will be generated from each agency. Each agency contact person will be updated on a weekly basis regarding surveillance efforts by sister agencies.

### *Should an initial positive indicator of WNV be found*

Health care providers will receive a "Health Alert" through the currently established Health Alert Network utilized by the district health departments. Health care providers will receive detailed information on the subject via fax or e-mail.

Veterinarians will receive information from the Idaho State Department of Agriculture.

A press release will be generated for new or significant detection of WNV in a given area.

## D. Educational opportunities

Please contact the appropriate agency listed below for available educational opportunities.

### West Nile virus health issues

District health department epidemiologists

District 1:
Panhandle Health District
Coeur d'Alene, ID
208-677-3481

District 2:
North Central Health District
Lewiston, ID
208-799-3100

District 3:
Southwest District Health Dept.
Caldwell, ID
208-455-5300

District 4:
Central District Health Department
Boise, ID
208-375-5211

District 5:
South Central Health District
Twin Falls, ID
208-734-5900

District 6:
Southeastern Health District
Pocatello, ID
208-233-9080

District 7:
District Seven Health Department
Idaho Falls, ID
208-522-0310

### Animal health issues

Idaho Department of Agriculture, Animal Industries
208-332-8560

U.S. Department of Agriculture, Animal and Plant Health Inspection Services, Veterinary Services, Boise Office
208-378-5631

### Wildlife issues

Idaho State Department of Fish and Game, Wildlife Diseases Laboratory
208-454-7646

### Pesticide usage — education and licensing

County Agricultural Extension Educators (faculty) or the Idaho State Department of Agriculture Licensing and Certification Section 208-332-8600 will provide information on proper pesticide usage and local use considerations.

**Training in mosquito abatement and vector control**
Idaho State Department of Agriculture Urban Pesticide Program
Provides, upon request and availability, training in mosquito abatement and vector control. Program Coordinator: Robert Hays**,** 208-442-2803

**Private training opportunities**
The American Mosquito Control association website found at http://www.mosquito.org/ , provides links to numerous commercial companies that may provide training. One such opportunity is known as the Mosquito University sponsored by Clark Mosquito Control. Other training opportunities may be available.

The Northwest Mosquito and Vector Control Association offers training sessions, typically twice a year. Check the web page at http://www.nwmvca.org/

## Section 3

## Mosquito Abatement

**A.** Mosquito facts and mosquito control myths

**B.** Idaho abatement district list and map

**C.** Idaho statutes regarding the formation and operation of an abatement district

**D.** General legal principles of mosquito abatement in Idaho

**E.** Model standard operating procedures for mosquito abatement districts

**F.** Model arbovirus surveillance and response guide for mosquito abatement districts

**G.** Estimated start-up costs

**H.** Special considerations for pesticide application and other control methods

**I.** Frequently asked questions from areas lacking an abatement district

# A. Mosquito facts and mosquito control myths

## I. Mosquito facts

- **Mosquito abatement programs are necessary because mosquito bites:**

  *may cause —*

  Mosquito-borne diseases
  Allergic reactions
  Annoyance

  *reduce —*

  Human productivity due to health issues
  Outdoor enjoyment and recreation
  Real estate and tourism revenues
  Weight gain in livestock
  Milk production in dairy cattle
  Livestock reproduction and survival
  Wildlife populations

- There are approximately 3,000 different species of mosquitoes throughout the world, of which 170 to 200 species occur in the United States. Approximately 25-30 species are found in Idaho.

- Mosquitoes need a standing water source to develop. Any standing water source such as a marsh, pond, creek, or lake, ditch, canal, storm water retention pond, flooded field, uncovered boat, discarded tire, swimming pool, or birdbath will allow mosquitoes to breed.

- Female mosquitoes bite because a blood meal is required for egg production. Only female mosquitoes bite.

- Female mosquitoes can take multiple blood meals and produce multiple generations during a single mosquito season. Under optimal conditions, a female *Culex* mosquito will lay 200 to 400 eggs every three days.

- Most eggs hatch into mosquito larvae within 24 - 48 hours.

- Only one male is required to fertilize a lifetime of egg production in the female.

- Mosquitoes generally live one to two months. *Culex* species may over winter and survive for up to a year.

- Mosquitoes often fly fifteen or more miles in a single night.

## II. Mosquito control myths (control options that don't seem effective)

- Sound and electric devices — these have no repellency effects and units are sold with no documented test results.
- Citronella (plants and candles) — there is no data to support the claim that citronella is a good mosquito repellant; its pleasant odor does not guarantee results.
- Skin moisturizing oil — field tests do not support claims that certain skin oils will repel mosquitoes. Mosquitoes are 30 times more sensitive to DEET than to skin moisturizers.
- Bug zappers — mosquitoes actually comprise less than 5% of the total bug zapper catch. The zappers kill many beneficial insects and tend to attract more insects than they kill.
- Birds — ornithologists state that purple martins and other swallow-like birds do not prefer mosquitoes and that mosquitoes make up less than 3% of their diets.
- Bats — insectivorous bat diets consist mainly of beetles, wasps, ants, flies, stoneflies, mayflies, moths and grasshoppers. Mosquitoes make up less than 1% of their diet. Location of bat houses should also take into consideration that bats sometimes carry rabies. Separation of bat houses from human populations is a good practice.

## B. Idaho Mosquito Abatement Districts (9/17/2002)

Bear River Mosquito Abatement District
Ron Peterson, Manager
327 Jefferson Street
Montpelier, Idaho 83254
Phone: 208-847-0545
E-mail: ctp@dcdi.net

Canyon County Mosquito Abatement District
Brian Benner, Director
721 E. Roosevelt Avenue
Nampa, Idaho, 83686
Phone: 208-461-8633 or 208-871-1860
E-mail: ccmad@att.net

Custer County Mosquito Abatement District
Scott Johnson, Secretary - Treasurer
Star Route
Mackay, Idaho 83251
Phone 208-588-3072

Fairfield Mosquito Abatement District
Cathy Miller, Manager
P.O. Box 1
Fairfield, Idaho 83327
Phone: 208-764-3202
E-mail: cmiller06@fs.fed.us

Fremont County Mosquito Abatement District
Woody Andersen, Supt. of Public Works
110 West Main
St. Anthony, Idaho 83445
Phone: 208-624-3494
E-mail: stacity@fretel.com

Gem County Mosquito Abatement District
Terri Quenzer, Secretary
Quinn Nuffer, Manager
526 West 3rd Street
Emmett, Idaho 83617
Phone: 208-365-5628
E-mail: gcmad@earthlink.net

Emmett County Golf Association, Inc.
Dave Watkins, Manager
6846 West Highway 52
Emmett, Idaho 83617
Phone: 208-365-2675

Jefferson County Mosquito Abatement District.
Reed Williams, Manager
167 South Third West
Rigby, Idaho 83442
Phone: 208-538-7778(day), 208-745-8424
E-mail: rwilliams@mascot.sd252.k12.id.us

Mackay Mosquito District - Custer County
Jack Anderson, Secretary
410 E. Custer Street
Mackay, Idaho 83251
Phone: 208-588-2438 (h)
E-mail: jckandrsn7@aol.com

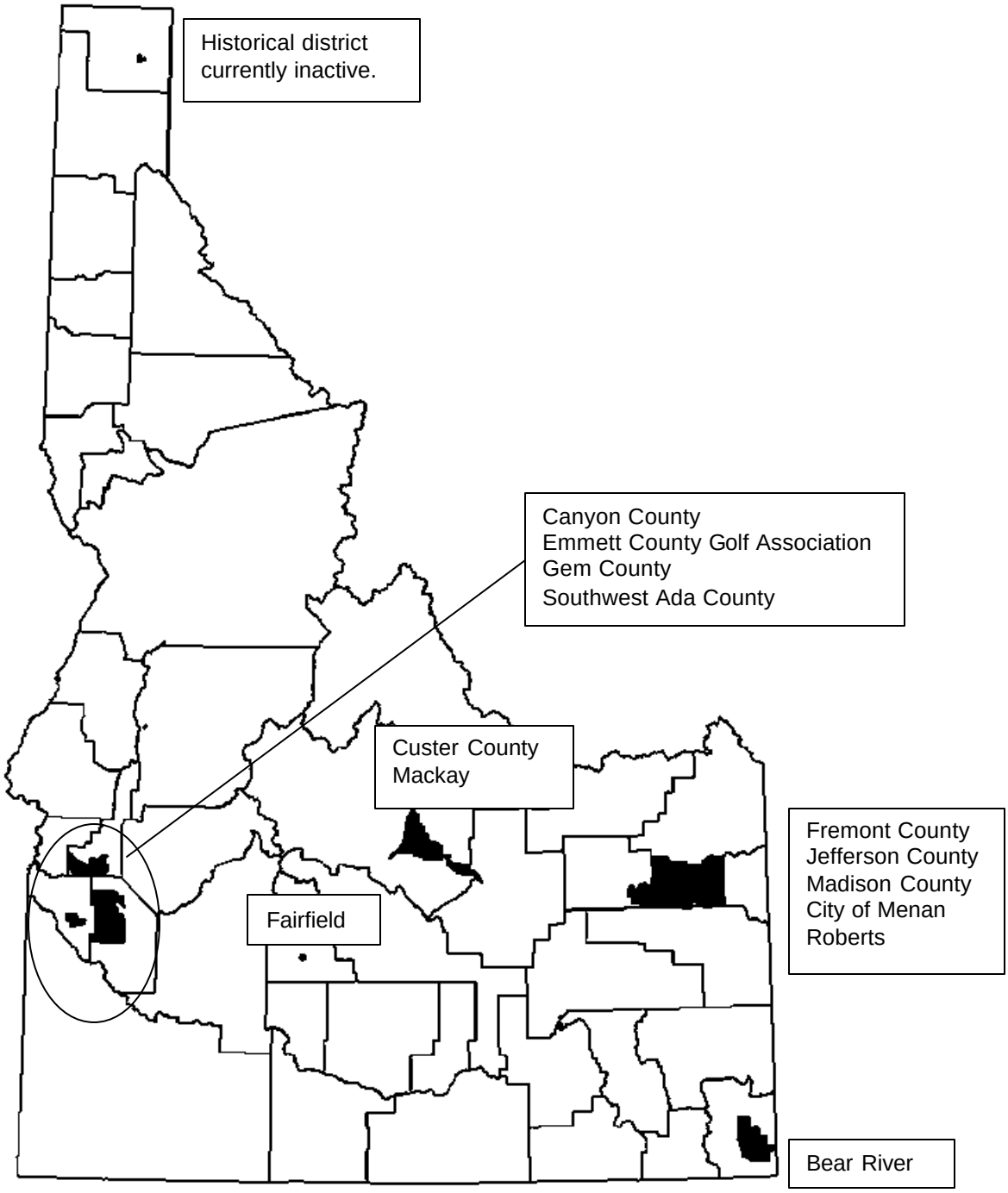
Madison County Mosquito Abatement District
Wendell Roth, Manager
750 North 1500 West
Rexberg, Idaho 83440
Phone: 208-356-3102 (cell) 208-390-3102
E-mail: tinker51@fretel.com

The City of Menan
Lyn Jacobson, Maintenance Supt.
Menan, Idaho 83434
Phone: 754-0438 (h) or 520-4369 (cell)

Roberts Mosquito Abatement District
Tom Buxton, Chairman
2898 East 800 North
Roberts, Idaho 83444
Phone 208-228-6851
E-mail: tbuxton@ida.net

Southwest Ada County Mosquito Abatement District
Jack Bennett, Director
2290 South Liberty
Boise, Idaho 83709
Phone 208-362-1440 or (cell) 208-869-7482
E-mail: madswac@aol.com

## Map of Idaho Mosquito Abatement Districts (2/22/03)



## C. Idaho statutes regarding formation and operation of a mosquito abatement district.

### Title 39, Chapter 28-01-11 (see following pages for text)

# Title 39, Chapter 28-01-11

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2801. AUTHORIZATION TO FORM ABATEMENT DISTRICTS. There may be formed, under the provisions of this act, districts for the abatement of mosquitoes and/or other vermin of public health importance, in any area of the state from territory of one or more counties, one or more cities or towns, or any combination or portion thereof.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2802. PROCEDURES FOR FORMATION OF ABATEMENT DISTRICTS. Upon presentation to the board of county commissioners of a petition requesting the formation of an abatement district, which is signed by qualified resident property owners of the territory of the proposed abatement district, equal to not less than ten percent (10%) of the resident property owners that voted in the last general election, the commissioners shall publish such petition when the following conditions are met: the petition must define the boundaries of the proposed district and assessed tax valuation of the property therein. When the above conditions have been met the county commissioners shall publish the petition, and if after thirty (30) days no protests are received, an election must be held at the next date specified in section 34-106, Idaho Code. The petitioners shall bear the expense of holding the election. If there are written protests, the county commissioners must hold a public hearing within thirty (30) days after receipt of the written protests and after the hearing hold an election. Notice of the time and place of such election shall be published at least once not less than twelve (12) days prior to the election and a second time not less than five (5) days prior to the election in at least one (1) newspaper having general circulation in the proposed abatement district. Only qualified electors who own land within the district, or the proposed district, and are residents of the county in which the district, or a portion thereof, is located, or are spouses of such landowners residing in such county, may vote on the formation of the district. A majority of the votes cast will establish the district.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2803. SELECTION OF OFFICIALS OF ABATEMENT DISTRICTS. A five (5) member board of trustees shall be appointed from within the area of the proposed abatement district to govern the abatement district. The trustees appointed shall at the first meeting of each year elect a president, secretary and treasurer to serve during the ensuing year. The officers of the board shall be bonded to the extent of five hundred dollars ($500) to five thousand dollars ($5,000) each as set by the county commissioners. The members of the board shall be appointed by the county commissioners of the county which they are to represent. When two (2) or more counties or portions thereof comprise an abatement district, the selection of trustees will be made by mutual agreement of the county commissioners concerned. Each trustee shall be a resident property owner and a registered voter. Trustees shall be appointed for four (4) years on staggered appointments. To initiate the board two (2) members are appointed for two (2) years, one (1) for three (3) years and two (2) for four (4) years. Subsequent appointments shall be for four (4) years. Trustees shall serve without compensation but will be reimbursed for necessary expenses involved with the performance of

their official duties. The county health officer and the county agent shall be ex officio members of the board. Whenever two (2) or more counties or portions thereof are included in the district, the health officer and county agent for each county shall be ex officio members of the board. The [directors or] heads of the following state departments or their designated representatives shall be considered ex officio members of the board and may be called upon for their advice and assistance in the handling of abatement problems affecting their direct interests: agriculture, fish and game, lands, transportation, water resources and health and welfare.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2804. POWERS AND DUTIES OF ABATEMENT DISTRICTS. The abatement district board of trustees is authorized:

a. To appoint a director to direct the activities of the district, in accordance with training and experience necessary to fulfill the duties of the position.

b. To appoint such other persons as necessary, determine their duties and compensation, and make rules and regulations respecting them.

c. To take all necessary and proper steps for the control of mosquitoes and other vermin of public health importance in the district and for these purposes shall have the right to enter upon any and all lands.

d. To sue and be sued.

e. Contract to purchase, hold, dispose of, and acquire by gift real and personal property in the name of the district. To exercise the right of eminent domain and for these purposes to condemn any necessary land and/or rights of way in accordance with general law.

f. To abate as nuisance breeding places of mosquitoes and/or other vermin of public health importance within the district or within migrating distance of the district by use of chemicals and/or permanent control measures and in this connection have the right to enter upon any and all lands.

g. To work with the lateral ditch water users associations, irrigation, drainage and flood control districts and other cooperating organizations. The board of trustees of the abatement district may supplement funds of cooperating organizations for improvement, repair, maintenance and cleaning of ditches which will temporarily or permanently eliminate mosquito breeding or for other activities which will benefit the district.

h. To file annually with the board of county commissioners for their approval an estimate of funds required for the next year, a plan of the work to be done, and methods to be employed. No procedure, work or contract for any year of operation shall be done or entered upon until plans and budget have been jointly approved by the board of county commissioners.

i. To file, annually or by February 1 of the succeeding year, with the board of county commissioners a report setting forth the moneys expended during the previous year, methods employed, and work accomplishments.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2805. METHOD OF FINANCING ABATEMENT DISTRICTS. The board of county commissioners must levy upon taxable property within the district a tax at a rate not greater than sufficient to raise the amount determined by the board of trustees as approved by the board of county commissioners, as necessary for the operation of the district for the ensuing year. In no event shall such tax exceed one tenth percent (.1%) of the market value for assessment purposes on all taxable property within the district. All taxes thus levied shall be collected in the same manner as other taxes and deposited to the credit of the abatement district and shall be used for no other purposes. Such funds may be withdrawn from the county treasury and

upon warrant of the board of trustees of the abatement district, signed by the president of the board and countersigned by its secretary, for the activities of the abatement district.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2806. ANNEXATION TO ABATEMENT DISTRICTS. Contiguous territories may be annexed to organized mosquito abatement districts upon petition of a majority of the legal voters in the territory seeking annexation and of the owners of more than half, by assessed value, of the taxable property in such territory, or by written request for annexation of a designated area, submitted to the trustees of the existing mosquito abatement district and signed by all members of the board of county commissioners in which county the territory seeking annexation is located. Upon receiving this petition or written request, the trustees of the existing mosquito abatement district must submit the question of annexation to the legal voters of the district at an election held subject to the provisions of section 34-106, Idaho Code.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2807. CONSOLIDATION OF ABATEMENT DISTRICTS. Two (2) or more contiguous districts may be consolidated. Any district board of trustees may seek consolidation by adoption of a resolution by a majority vote of its members. Consolidation is accomplished by a majority vote of the members of each of the boards of trustees involved in the consolidation. The consolidated districts may enter into arrangements for pooling funds and joint use of personnel, equipment, and supplies. The activities conducted under joint arrangement shall be considered as if conducted directly by the board having jurisdiction over the area concerned. The board of county commissioners must be given written notice of consolidation.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2808. EXISTING RIGHTS PRESERVED. It is the purpose of this act to provide additional and cumulative remedies to prevent, abate and control the spread of mosquitoes and/or other vermin affecting the public health, safety and welfare of the people of the state of Idaho. Nothing herein contained shall be construed to abridge or alter rights of action or remedies in equity or under the common law or statutory law, criminal or civil, nor shall any provision of this act, or an act done by virtue thereof, be construed as estopping the state or any municipality or person in the exercise of their rights of equity or under the common law or statutory law to suppress or abate nuisances.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2809. SHORT TITLE. This act may be cited as the Idaho Mosquito Abatement Act.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2810. WITHDRAWAL. Any portion of a mosquito abatement district which will not be reasonably benefited by remaining within such district may be withdrawn as in this section provided. Upon receiving a petition signed by fifty (50) or more landowners within the portion desired to be withdrawn from any mosquito abatement district, or by a majority of such landowners, if there are less than one hundred (100) landowners within the portion sought to be withdrawn, requesting the withdrawal of such portion from the district on the ground that such portion will not be reasonably benefited by remaining in said district, the board of county commissioners shall fix a time for hearing on such petition and for hearing protests to the continuance of the remaining territory as a mosquito abatement district. The hearing shall not be less than ten (10) days nor more than thirty (30) days after the receipt thereof. The board shall, at least one (1) week prior to the time so fixed, publish notice of such hearing by one (1) publication in a newspaper of general circulation in the district, which the board deems most likely to give notice to the inhabitants thereof, of the proposed withdrawal.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2811. HEARING OF PETITION FOR WITHDRAWAL. Any person interested may appear at the hearing and object to the withdrawal of the portion from the district, or may object to the continuance of the remaining territory as a mosquito abatement district. The board of county commissioners shall consider all objections and shall pass upon the same, and if it finds that portion of the district sought to be withdrawn will not be reasonably benefited by remaining within the district, and the territory not sought to be withdrawn will be reasonably benefited by continuing as a mosquito abatement district, it shall grant the petition and enter an order thereon upon its records. In the event the board finds the district will not be reasonably benefited by continuing as a mosquito abatement district, it shall enter an order upon its records completely dissolving and terminating the previously existing mosquito abatement district. Upon the withdrawal of any territory from a mosquito abatement district, as in this section provided, all property acquired for the district shall remain vested in the county and be used for the purposes of the district. Upon complete dissolution of a mosquito abatement district as herein provided, all property acquired for the district shall remain vested in the county and be used for any general purpose of the county.

**Other related statutes:**

**Agricultural Pest Statutes (Title 25, Chapters 2601-2613):** The Animal Pest statutes appear to control animals and insects that would be more appropriately categorized as predatory. The mosquito abatement statutes listed above directly address the issue of mosquito abatement. Mosquito abatement and the means used to carry those activities out should remain governed by abatement statutes. The formation of abatement districts following the mosquito abatement statutes should be encouraged.

TITLE 25
ANIMALS
CHAPTER 26
EXTERMINATION OF WILD ANIMALS
AND PESTS IN COUNTIES

25-2601. CONTROL OF PESTS -- POWERS OF COUNTY COMMISSIONERS. The board of county commissioners of each and every county of this state are all hereby

granted full power and authority to declare any predatory animal, including coyote, that feeds upon, preys upon or destroys any poultry or livestock of any kind upon any public or private lands within their respective counties, or any rodent, jack-rabbit, gopher, ground squirrel, cricket, locust, grasshopper and other insect pests or plant disease causing organisms/agents or any other invertebrate organism that feeds, preys upon, or destroys any livestock, natural grasses, or cultivated crops of any kind upon any public or private lands within their respective counties, to be agricultural pests, and to take all steps that they may deem necessary to control such pests.

## D. General legal principles of mosquito abatement in Idaho

Letter from the State of Idaho Office of the Attorney General addressing questions from Senator Brad Little (11/6/02).
Please click here.

## E. Model standard operating procedures for mosquito abatement districts in Idaho. (See the following pages.)

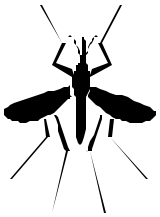
# MODEL

# STANDARD OPERATING PROCEDURES*

# FOR MOSQUITO

# ABATEMENT DISTRICTS

# IN IDAHO



*All mosquito abatement districts in Idaho are required
by law (Idaho Statue Title 39, Chapter 28-04)
to develop an annual plan for standard operations.

This document outlines the basic activities carried out by abatement districts according to the nationally recognized integrated pest management model.

This is not meant to be a complete text on mosquito abatement activities.
For more information, visit the following websites:

American Mosquito Control Association (AMCA)
http://www.mosquito.org/

Northwest Mosquito and Vector Control Association
http://www.nwmvca.org/

## Contents

# Model Standard Operating Procedures

## I. Function and Scope of Mosquito Abatement Districts (MADs)

Mosquitoes have both positive and negative impacts on the environment. Mosquitoes provide a food source for fish and other aquatic organisms. They are also food for bats, birds, spiders, and dragonflies. However, they transmit pathogens that cause many harmful mosquito-borne diseases worldwide, including malaria, encephalitis, yellow fever, dengue fever and the latest mosquito-borne virus to reach the USA, West Nile virus.

Each MADs primary function is to protect the public's health and safety from mosquito-borne diseases. Additionally, as public health protection is fulfilled MAD programs reduce pest mosquito populations. Successful abatement programs improve the quality of life, promote economic development, and facilitate enjoyment of natural and man-made attractions. In order for a MAD to be effective in its functions, it must implement necessary integrated control measures over a large area.

MADs may consider different levels of activity to perform these functions. The level considered may change with local conditions and vector activity. Activity levels can be passive, proactive, or active, as outlined below.

**a. Passive**

— Control areas proposed
— Staff identified and equipment available to respond to known outbreak

**b. Proactive**

— Control areas defined
— Adequate staff and equipment to implement control plan
— Educational elements in place
— Surveillance and species identification activities ongoing
— Good reporting and planning functions operational
— Establish mutual aid or cooperative agreements with other agencies or jurisdictions.

**c. Active**

— Control areas defined
— Adequate staff and equipment to implement control plan
— Good reporting and planning functions operational

In addition, MADs may consider no or minimal action when mosquitoes do not represent a vector-borne disease threat in the district.

## II. Surveillance / Monitoring

### a. Mosquito Trapping and Identification

In order to determine where specific mosquito species exist in a particular area of Idaho, it is necessary to trap and identify them. Once they are identified, the level of risk for disease can be better understood. Some mosquitoes are only pests not capable of transmitting disease, while others are both pests and disease vectors.

As of this printing, $CO_2$-baited traps are the preferred method for collecting biting female mosquitoes. These traps are typically set one or two separate nights per week for a 12-14 hour period during the calendar months of April through October. This time frame may vary depending on the occurrence of winter frosts (when mosquito activity diminishes). The trap collections are picked up the next day. Mosquitoes are then sent to the state public health laboratory for evaluation (unless the abatement district has a trained entomologist). Mosquitoes are identified under the microscope by genus and species. Mosquitoes are pooled into vials by similar species, date and collection location. The resulting data will be maintained in a master database at the state public health laboratory and a copy will also be returned to the submitting agency for recording and evaluation. This data will help determine what control measures are warranted (mosquito abatement, source reduction, etc.)

### b. Surveillance for mosquito breeding habitats

The most effective method of mosquito control is the reduction, modification, or elimination of mosquito breeding source habitats. This form of control cannot be accomplished in many cases due to legal, fiscal and environmental constraints. Mapping mosquito breeding habitat locations can help with source reduction activities and strategically pinpoint target areas for community education efforts and/or insecticide application. Breeding habitats should be identified, described, mapped (ideally by GPS coordinates) and cataloged.

### c. Monitoring for larvae

Timely inspections and evaluations of mosquito larvae populations in aquatic habitats by dip-collection is a key tool to determine the mosquito growth phase and numbers. As mosquito larvae threshold densities approach threshold values, mosquito management activities are applied to the breeding habitats to prevent the larvae from becoming biting adults (see prevention and threshold determinations below).

### d. Mosquito landing rates

Surveillance of the adult mosquito landing rates permits excellent evaluation of the prevalence of mosquitoes within residential areas. Mosquito landing rates are determined best during crepuscular periods (two hours after sunset or two hours prior to sunrise). The surveyor should wear dark colored clothing

and sit or stand quietly for a few minutes, collecting mosquitoes with an aspirator as they land on his or her clothing. The required equipment for this type of surveillance is a battery-operated or simple mouth-suction aspirator. The collected mosquitoes are taken back to the district work area for identification and control measures are determined. A modification of the landing rate is the mosquito-biting (or "light and bite") rate, in which the mosquito is not aspirated until it bites the surveyor. This method is not recommended in areas where mosquito-borne virus occurs.

**e. Monitoring for virus**

Typically mosquitoes are collected in traps (as described above) from April through October and pooled by species, date, and location. Mosquito pools are tested for the presence of arboviruses at the Idaho State Bureau of Laboratories in Boise, Idaho. Test results are maintained by the state Office of Epidemiology in the Idaho Department of Health and Welfare. Copies are furnished to the submitting agency and the corresponding district health department.

## III. Prevention

Mosquito control is important because it reduces the number of flying adult mosquitoes, thereby reducing the risk of mosquito-borne virus transmission to humans and animals.

**a. Eliminating or modifying mosquito breeding habitats**

The elimination or modification of mosquito breeding habitat, when feasible and within regulations, is a critical component and the best long-term solution for mosquito control. These activities include avoiding over watering in public and private areas, draining and/or filling of areas of shallow stagnant water, increasing flow rates in irrigation and drainage canals, eliminating water holding containers and reducing and/or eliminating vegetation in slack or stagnant water which supports mosquito breeding. Most of these activities can be achieved through cooperative agreements with other agencies and political subdivisions, and by the use of public education campaigns.

**b. Abatement of mosquito larvae in their aquatic habitats**

Mosquito larvicide applications selectively target mosquito larvae and are effective in reducing mosquito populations. This type of mosquito control measure requires considerable personnel, equipment, materials, planning, mosquito survey work and expense. These types of applications offer the most selective chemical control of mosquitoes. *Bacillus thuringiensis israelensis* (Bti) and *Bacillus sphaericus* (Bs) are applied to mosquito breeding habitats when mosquito larvae are found in the 1$^{st}$ to 3$^{rd}$ instar stage of life. Aquatic sites can fall under one of many different jurisdictions, each of which may have limitations to insecticide usage. Please refer to the “Special considerations for pesticide applications and other control methods” section of this plan prior to the use of any insecticide.

## IV. Adult mosquito intervention

This method should be considered when rapid reduction in adult mosquito populations is warranted.

The ultra low volume (ULV) adulticide spray method is typically used where mosquito trapping, landing or biting rate counts, and verifiable complaints from MAD constituents indicate the presence of flying adult mosquitoes.

The current mosquito insecticide (mosquitocide or adulticide) used by most MADs is a malathion-based ULV concentrate. This product is a non-residual insecticide with excellent efficacy against flying mosquitoes. In Idaho much cropland is present and malathion is used because it generally does not have cropland restrictions on its label directions. Pyrethrin-based products may be used in residential areas-avoiding cropland and sensitive aquatic areas according to label restrictions.

ULV spray treatments for flying adult mosquitoes are routinely announced publicly at the beginning of the mosquito season. Some abatement districts have established a “Call Before Spraying List” for those residents who wish to be called prior to ULV spraying in the areas in which they live. All ULV treatments are restricted to property within the mosquito abatement district's jurisdiction, taking into consideration special situations. All treatments must be applied according to the insecticide’s label directions and the state requirements related to licensure. All treatment equipment is calibrated as per the insecticide label directions and certified to be correctly operational by the Idaho Department of Agriculture or other recognized authority.

Exceptions to the approved operational plan are reviewed on a case-by-case basis with priority given to emergency health related issues. The board of trustees and the county commissioners must approve any substantial changes to these operational plans.

During heightened arbovirus detection, ULV spraying treatments will likely increase to reducing the adult mosquito population.

## V. Threshold determinations for abatement activities

The intent of the mosquito abatement districts is to ensure that applications of insecticides are made only when necessary. The threshold factors are:

- Results of mosquito monitoring (using recognized surveillance methods such as larva surveys, traps or landing rates) indicate that a threshold is reached (for example, when five or more adult mosquitoes per trap or landing period, or three or more larvae in a dip are present)

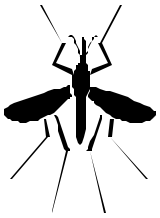
- When public complaints and service requests are validated by one or more recognized surveillance methods

- When potential of mosquito-borne disease is imminent in the District area
- When mosquito-borne disease is present

Please refer to the Model Arbovirus Surveillance and Response Guide in the next section.

**F. Idaho model arbovirus surveillance and response guide.**
**(See the following pages.)**

# IDAHO MODEL
# ARBOVIRUS SURVEILLANCE
# AND RESPONSE GUIDE



## A Phased Response to Arbovirus Detection

This document provides guidance for modifying standard operating procedures in response to a suspected or detected arbovirus. Please note that this is an addendum to the model standard operating procedures may need to be reviewed and approved by your County Board of Commissioners as directed by Idaho Code.

# Guidelines for the Phased Response to Arbovirus Detection

The primary mission of the model plan is to protect the public health and safety of people in Idaho. The following arbovirus protection provisions for mosquito abatement districts are proposed as ideal responses to various indicators of virus in the environment. These responses are presented in a phased manner with the level of response categorized by perceived risk to human health. This response plan itself was modeled after plans adopted by many states in the continental United States, and as such, is considered consistent with acceptable national practices.

## I. Arbovirus Detection

Testing of mosquito pools, dead birds, and human samples will be conducted at the Idaho State Department of Health and Welfare, Bureau of Laboratories. Horse samples will be tested at the Idaho State Department of Agriculture, Animal Industries Laboratory.

## II. Phased Response (Risk) Categories

**0:** Probability of outbreak in humans — none
**1a:** Probability of outbreak in humans — remote
**1b:** Probability of outbreak in humans — remote but suspected due to previous activity
**2:** Probability of outbreak in humans — low
**3:** Probability of outbreak in humans — moderate
**4:** Probability of outbreak in humans — high
**5:** Probability of outbreak in humans — outbreak in progress

## 0 – Risk Category

Probability of outbreak in humans – None

Definition – Off-season; adult vectors inactive, climate unsuitable for breeding.

Recommended Response — Acquire surveillance and control resources necessary to enable emergency response. Initiate community outreach and public education programs along with the local health district.

## 1a – Risk Category

Probability of outbreak in humans – Remote

Definition – Spring, summer or fall; areas unlikely to have arbovirus epizootic during the year based on lack of previous or current arbovirus activity in the region.

Recommended Response – Same as Risk Category 0, plus the following: Conduct entomologic survey (inventory and map mosquito breeding areas). Conduct community outreach and public education. Monitor avian mortality, human encephalitis/meningitis and equine surveillance.

## 1b – Risk Category

Probability of outbreak in humans – Remote

Definition – Spring, summer or fall; areas anticipating arbovirus epizootic during the year based on previous arbovirus activity in the region; no current surveillance findings indicating arbovirus epizootic activity in the area.

Recommended Response – Same as Risk Category 1a, plus the following: Do source reduction. Use larvicides at specific sources identified by entomologic survey, targeted at amplifying and vector species. Maintain avian mortality, vector, and virus surveillance. Conduct public education emphasizing source reduction.

**NOTE: ABATEMENT DISTRICTS DO NOT ROUTINELY MAKE PESTICIDE APPLICATIONS OUTSIDE THEIR DESIGNATED DISTRICT BOUNDARIES.**

## 2 – Risk Category

Probability of outbreak in humans – Low

Definition – Spring, summer or fall; areas with initial, sporadic, or limited arbovirus activity in birds and/or mosquitoes.

Recommended Response – Response as in Risk Category 1b, plus the following: Increase insecticide-based larval control and source reduction efforts. Enhance public education emphasizing personal protection measures and equine vaccination. Enhance adult mosquito surveillance activities such as mosquito trapping and testing for virus to further quantify epizootic activity. Target adult control efforts to particular locations, when surveillance indicates potential for increased human risk. Follow-up to evaluate the efficacy of mosquito control activities.

## 3 – Risk Category

Probability of outbreak in humans – Moderate

Definition – Spring, summer or fall; areas with initial confirmation of arbovirus in a human and/or horse, or moderate arbovirus activity in birds and/or mosquitoes.

Recommended Response – Same as Risk Category 2, plus the following: Increase frequency of surveillance and control activities as long as there continues to be the potential for human risk to persist or increase.

## 4- Risk Category

Probability of outbreak in humans – High

Definition – Spring, summer or fall; quantitative measures indicating arbovirus epizootic activity at a level suggesting high risk of human infection (for example, high dead bird densities, high mosquito infection rates, multiple positive species, horse or mammal cases indicating escalating epizootic transmission, or human case and high levels of epizootic activity) and abundant adult vectors.

Recommended Response – Same as Risk Category 3, plus the following: Expand public information program to promote personal protective measures on television, radio and newspaper. Continue source reduction, risk communication about adult mosquito control; initiate or continue active surveillance for human cases. Continue escalating adult mosquito control and monitoring (efficacy) in target areas of potential human risk.

## 5- Risk Category

Probability of outbreak in humans – Outbreak in progress:

Definition – Multiple confirmed cases in humans; conditions favoring continued transmission to humans.

Recommended Response - Same as Risk Category 4, plus the following: Increase risk communication about adult mosquito control. Escalate adult mosquito control and monitoring of control efficacy in target areas of human risk.

If outbreak is widespread and covers multiple jurisdictions, activate mutual aid and cooperative agreements.

## II. Arbovirus Alerts

### a. Positive test results in mosquitoes or dead birds

Mosquito and dead bird test results will be reported from the state health department to the submitting agency and the affected district health department. The general public will be alerted through timely press releases. Press releases will encourage individuals to take personal protective measures against mosquito bites and to assure that horses have been properly vaccinated.

### b. Positive test results in humans or horses

Each positive laboratory test on a human or a horse will be investigated to determine if the individual had traveled to a state already experiencing WNV infections or if that infection was acquired in Idaho. Formal mosquito abatement districts and local district health officials will be provided generalized case information to assist in the initiation of increased surveillance and control measures. Due to confidentiality issues, press releases will be generated but the identity of the person or horse and the exact location will be withheld. Information will be relayed in terms of county or district affected. The general public will be alerted through timely press releases. Press releases will encourage individuals to take personal protective measures against mosquito bites and to assure that horses have been properly vaccinated.

## G. Estimated start-up and operational costs for mosquito abatement districts.

The following estimates are provided for planning purposes only. Some of the items may already exist in one of the other county operations (such as office or shop space in the weed control or road departments) and need not be duplicated.

The following budget list is not meant to be all-inclusive because different areas have different needs or challenges. The list will provide planners with the basic elements for the establishment of a mosquito abatement program. Please do not total the columns because alternative items have been placed in the list to increase the likelihood that all factors will be considered, *e.g.* facility mortgage payment and monthly office rent. Pick the items that need to be considered for your operation, expand on that list to cover items particular to your planning area, then apply local cost and budget factors to provide an estimate for planning purposes. See footnotes for details of some estimates.

| **Budget Estimates** | **1st/Annual** | **Capital Purchase & Replacement** |
|---|---|---|
| Capitol Equipment | $107,800 | $ 12,000 |
| Non-Capitol Equip. | $ 6,600 | $ 3,000 |
| Facilities | $174,500 | $ 24,000 ($2,000 per month) |
| Materials and Supplies | $ 10,500 | $ 10,500 |
| Manpower | $124,400 | $124,400+ |
| Operations | $ 33,106 | $ 33,106+ |

**Equipment – Based on District of 22 Square Miles**

| | | | |
|---|---|---|---|
| Capitol Equipment | | | |
| Pickup trucks | 3 @ $16,000 | = | $48,000 |
| ULV Spray Unit | 3 @ $10,000 | = | $30,000 |
| Larvicide Granule Spreader | 3-4 each @ $700 | = | $ 2,800 |
| Computer | 2 @ $2,000 | = | $ 4,000 |
| 4-Wheeler | 1 @ $10,000 | = | $10,000 |
| Trailer | 1 @ $3,000 | = | $ 3,000 |
| Microscope and Lights | 1 @ $2,000 | = | $ 2,000 |
| Forklift | 1 @ $8,000 | = | $ 8,000 |
| $12,000-16,000 per year est. replace fund | | | **$107,800** |
| General Use Equipment | | | |
| Traps | 10 @ $100 | = | $ 1,000 |
| GPS Units | 4-5 @ $200 | = | $ 1,000 |
| Spill Kit | 4 @ $100 | = | $ 400 |

| | |
|---|---|
| Wind speed, temperature and related weather devices. | $ 400 |
| Night operations, warning light, flashlights, signs, misc. hand tools, etc. | $ 800 |
| Office Equipment (Desks, Chairs, FAX machine, file cabinet, etc | $ 3,000 |
| | **$ 6,600** |

**Facilities**

Secure chemical and equipment storage area. = $120,000 (minimum)
*Administrative Office, Laboratory and Record Storage, Run-on, Run-off surface water addressed.*

| | |
|---|---|
| Water Supply cross connection protection | $ 3,500 |
| Land | $ 40,000 |
| (approx. two acres based on 18-20,000 per acre) | |
| Wash Rack/Pad | $ 6,000 |
| Rinsate Recovery System | $ 2,000 |
| Chemical Containment | $ 3,000 |
| | **$174,500** |

**Materials and Supplies (annual estimates based on 22 square mile operation, ground application only)**

| | |
|---|---|
| Larvacide[1] | $2,500 |
| Adulticide[2] | $3,100 |
| Office Supplies | $ 600 |
| Vehicle (Gas, Oil) | $2,500 |
| PPE – Gloves, coveralls, aprons, respirators, boots, goggles, etc. | $1,000 |
| | **$9,700** |

**Manpower** **$124,400 +**

| | |
|---|---|
| Director | $40,000 + Benefits |
| Supervisor | $28,000 + Benefits |
| Office (P/T) | $ 9,400 |
| Seasonal Personnel | $47,000 |

*5 individuals X $10.00 (per hour w/tax and ins.) x 4,700 hours/year*
*Manpower estimates based on 2002 wages, estimate 3.5% increase each year thereafter.*

**Operations**

**Routine Services – Annual Basis**

| | |
|---|---|
| Telephone/Cell Phone Communication | $ 3,000 |
| Power | $ 1,200 |
| Internet Service | $ 300 |

| | |
|---|---|
| Education - PSA / Community Outreach / Promotion | $ 1,000 |
| Licenses/Training[3,4] | $ 3,120 |
| Surveillance / Monitoring[5,6] | $ 8,400 |
| Calibration of Sprayers | $ 200 |
| Container Recycling | $ n/c |
| Medical Monitoring/Respirator Fit Test (Dibrom) | $ 400 |
| Accounting / Audit | $ 1,500 |
| Legal / Counsel | $ 1,000 |
| Vehicle and general liability Insurance (ex:) | $ 6,086 |
| Water (drinking and irrigation) | $ 300 |
| Sewer/ Trash | $ 600 |
| Survey Service – (Slope and Grade) | $ 1,000 |
| Drainage Work – Project Based | $ 5,000 |
| | **$33,106** |

*Based on 2002 data from Canyon County, annual increases anticipated*.

**Contracted Services**

| | |
|---|---|
| Drainage Contractor – Project Based | $ 5,000 (+ or -) |
| Ground application | $70 - 200 per hour |
| Air application | $1-6 per acre |

*Contracted application rates are estimates based on historical values and may not be applicable at current date or in your given situation. $5,000 was placed into plan to cover drainage activities on an "on-call" basis.)*

**Details of estimates**

1. Larvacide — $2,500 on a 22 square mile district (100 gal @ $25/gallon)
2. Adulticide— $3,080 on a 22 square mile district (110 gal @ $28 per gallon)
3. Licensure — Driving and Pesticide Applicator, $120
4. Training — Examples of training that may be required (Mosquito University, PPE, Hazardous Materials, Fork Lift and Mixer-Loader). Estimated training cost is $3,000.
5. Surveillance/ Monitoring estimates are based on 6 traps and average summer counts. One trap should service approximately 4 square miles (more or less). Mosquito identification and separation for virus estimates are based on 0.6 hours per trap night X 2 times per week = 1.2 hours per week x 26 weeks = 31 hours @ $15 per hour = $465 per trap (rounded up), per year. Another $935 is estimated to manage (mileage, materials and manpower @ $18 per trap night) the trap and collect samples during one season. This estimate averages $1,400 per trap site, and $8,400 for the six traps in the example.
6. Mosquito identification and separation of trapped mosquitoes for virus testing (if activity contracted separately from surveillance and monitoring) — 4 hours per trap night X 2 times per week = 8 hours per week x 26 weeks = 208 hours @ $15 per hour = $3,120 per year (example based on 6 traps and average summer counts).

## H. Special considerations for pesticide application and other control methods

### Aerial applications

All proposed aerial applications of pesticides must be reviewed by the FAA and performed by a licensed professional applicator.

### Aquatic applications

Proposed application of pesticides to surface water used for drinking purposes must be accompanied by a short-term activity exemption from the Idaho Department of Environmental Quality. This exemption must be obtained prior to initiating pesticide application.

### Bee colony locations

ISDA requires beekeepers within Idaho to be registered; however, some beekeepers do not register their hives or may move them to new locations every year. Check with ISDA for registered beekeepers on a county-by-county basis, prior to spraying. Insecticides used for mosquito control will kill pollinating bees if improperly applied. Follow pesticide label instructions and ISDA rule IDAPA 02.03.03.400 for restrictions related to the protection of pollinators. In general application of pesticides toxic to bees shall be made during the time frame starting three hours prior to sunset and ending three hours after sunrise.

### Biologically-controlled areas

An example includes the use of organisms to consume the noxious weeds purple loosestrife and yellow star thistle. Adulticide applications should be avoided in these areas. Check with the local county agriculture extension agent for information in your area.

### Chemically sensitive individuals

Idaho does not have a registry for individuals with chemical sensitivities. In practice, most mosquito abatement districts have created lists of citizens who wish to be notified prior to application in their area. Notification allows the person to leave the immediate area or take other actions during pesticide application. Publicizing spraying activities and MAD contact information prior to pesticide application may provide an opportunity for such individuals to identify themselves.

### Endangered or threatened species

For information related to Endangered Species Act (ESA) specific issues in your area, contact the Idaho Conservation Data Center at the Idaho Department of Fish and Game, and ask for George Stephans 208-334-3402

**Organic farms**
Certified organic farms are registered with the Idaho State Department of Agriculture (ISDA). Please check with ISDA for organic operations in your area prior to pesticide application. It is important to avoid pesticide application that would result in pesticide residues on organic products.

**Restricted pesticide application areas**
These areas are established according to ISDA laws and rules. Locations of restricted areas may be obtained by contacting ISDA

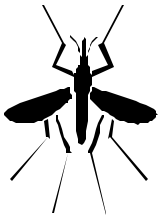
**Water irrigation districts, canal companies, and drainage districts**
These operations, if working properly, should not promote mosquito breeding because the water should be flowing fast enough to inhibit mosquito breeding site development. These operations also have the ability to evaluate and initiate drainage of breeding sites on property controlled by them.

**Wetlands**
All drainage projects should be evaluated in terms of the requirements put forth in the Clean Water Act and enforced by the U.S. Army Corps of Engineers.

**Private and commercial recreation areas**
For private or commercial recreational areas (e.g., Idaho Power Co. parks and campsites) please contact the owner or managing agency for any restrictions on that property.

**City, county, state, and federal lands**
Please contact the managing agency for any restrictions on that property.

# I. Frequently asked questions from areas lacking abatement districts



**Q. Why should we form an abatement district and what are the advantages?**

**A.** Mosquito abatement districts (MADs), are formed for many reasons. One is to protect the public's health by reducing disease-carrying mosquitoes. Arboviruses (arthropod borne viruses) may be life threatening to some individuals and cause life-long debilitating disease in others. MADs also provide a community service by eliminating pest mosquitoes which annoy residents, worry livestock (an economic issue), and inhibit recreational opportunities. MAD formation can be an effective method of pooling financial, labor and capital equipment costs.

**Q. Can we ask nearby abatement districts to abate mosquitoes in our area even though we don't have an abatement district of our own?**

**A.** No. MADs function as described in Statute (Title 39, Chapter 28-04) to abate mosquitoes within a described district. Besides lack of authority, barriers to MADs abating mosquitoes outside of an MAD include a lack of funding for such activities, liability issues, a lack of known mosquito breeding site locations, and a lack of mapping of areas of special consideration.

**Q. How long does it take to establish an abatement district?**

**A.** The mosquito abatement act was designed to allow for local residents to vote for, fund, implement and manage the mosquito abatement activities in their immediate area. The election process and the setting of the levy to collect operational funds as a tax assessment take the most time. The whole process has been known to take an average of two years to complete.

**Q. Why aren't abatement districts countywide?**

**A.** Ideally abatement districts should be countywide. Abatement districts already in existence are finding it difficult to annex adjacent or non-adjacent regions in their counties when the need arises. In fact, the process of annexation is just as difficult as establishing a new abatement district. Abatement districts may include property in two or more counties and operate under one management plan as long as the district area is contiguous.

**Q. Who should make abatement decisions?**

**A**. Abatement districts are headed by county commissioner-appointed trustees who prioritize abatement efforts (Title 39, Chapter 28-03). A MAD shall employ a director to make the day-to-day management / operational decisions. These decisions are based on an approved annual work plan.

**Q. How can we get some start-up funds to begin abatement activities prior to the influx of revenue through taxation?**

**A.** Tax anticipation loans may be obtained from lending institutions for districts that have formed but are not receiving revenues yet. Legislation may clear the way for other methods of funding such as deficiency warrants or a grant program but at this time those options have not be authorized.

**Q. Can the District Health Departments help with mosquito abatement?**

**A.** The district health departments are not licensed pesticide applicators. District health departments are ex-official members of the board of trustees for each existing MAD and therefore are active in the administration of the MAD by offering guidance related to public health. Several of the health districts have personnel that have vector control experience and or knowledge and may be of assistance but as of this time there are no formal vector control specialists available either at the local or state health department level.

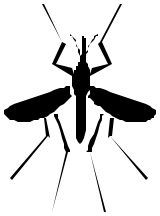
**Q. What should we do if surveillance efforts in our area detect WNV (positive mosquito pool, positive dead bird, positive horse or human) and we are not in an abatement district?**

**A**. Public education about personal protection and the reduction of breeding sites near homes is the first option. The district health department is a strong ally with the ability to provide education on these topics. Other options include the identification of mosquito breeding sites and working with landowners to eliminate standing water and the formation of an abatement district.

**Q. Can existing abatement districts make requests directly to FEMA for assistance if they are unable to financially maintain adequate abatement when arboviruses are detected?**

**A**. No. The MADs should contact the county emergency coordinator to facilitate discussion with the county commissioners about declaring an emergency. The county commissioners have the authority to declare a state of emergency for the county. When emergency needs exceed the county's ability to respond, the county can send a request for assistance to the State to the Bureau of Disaster Services. The Bureau of Disaster Services handles the request with the Governor. If the emergency needs exceed the state's ability to respond, the Governor can request federal assistance through FEMA.

## Section 4



# Appendices

**A.** Glossary of terms

**B.** Agency contact list

**C.** DEQ aquatic pesticide application rule

**D.** Larviciding pesticides and safety issues

**E.** Adulticiding pesticides and safety issues

**F.** Training required prior to pesticide usage

**G.** Example Mosquito Operations plan:
Canyon County Mosquito Abatement District
emergency plan

## Appendix A:
## Glossary of Terms Related to Mosquito Control and Public Health

**adulticide** a type of pesticide used to kill adult mosquitoes

**arthropod** a group of animals that do not have a backbone such as insects, spiders, and crustaceans

**assay** a laboratory test

**avian surveillance** monitoring of the bird population for presence of a disease

***Bacillus sphaericus*** a bacterium; type of biological pesticide used to eradicate mosquito larvae in water (mosquito larvae die after ingesting this bacteria)

***Bacillus thuringiensis* var. israelensis (BTI)**
a bacterium; type of biological pesticide used to eradicate mosquito larvae in water (mosquito larvae die after ingesting this bacteria)

**catch basins** grates seen at street corners for water runoff

**communicable diseases**
illnesses due to specific infectious agents or their toxic products that can be transmitted from an infected person or animal to a susceptible host; either directly or indirectly through an intermediate host

***Culex pipiens*** species of mosquito, a major vector for West Nile virus, commonly found in urban areas; breeds in fresh but stagnant water such as backyard containers and storm drains

**DEET** DEET (chemical name, N,N-diethyl-meta-toluamide) is the active ingredient in many insect repellent products

**encephalitis** inflammation of the brain

**etiologic agents** biologic organism or chemical material that cause disease

**gravid traps** type of mosquito traps designed to attract pregnant female mosquitoes

**IgM-capture enzyme immunoassay (EIA) testing**
a laboratory analysis for the presence of immunoglobulin M antibodies (antibodies that rise during the acute phase of an illness and are a sign of recent infection)

**indirect IgG enzyme immunoassay (EIA) testing**
a laboratory analysis for the presence of Immunoglobulin G antibodies (longlasting antibodies; their presence are a sign of past infection)

**larvae** immature mosquitoes; stage which hatches from the egg, prior to adult stage

**larvicide** a type of pesticide used to eradicate immature mosquitoes (larvae)

**meningitis** inflammation of the lining of the brain and spinal cord which can be caused by a virus or a bacteria

**methoprene** a type of larvicide; chemical that is used to prevent mosquito larvae from emerging and developing into adult mosquitoes

**migratory birds** birds that fly south for the winter and return north in the spring

**mosquito breeding site** where mosquitoes lay eggs, typically stagnant water with organic material

**mosquito pool** a group of mosquitoes collected in one area and combined for laboratory testing

**N,N-diethyl-metatoluamide** DEET (chemical name, N,N-diethyl-meta-toluamide) is the active ingredient in many insect repellent products

**necropsy** autopsy on an animal

**outbreak** an unexpected increase in frequency or distribution of a disease

**overwintering** a period of rest or hibernation by which insects survive the winter

**pesticide** substance used to kill pests such as insects, mice and rats; insecticide is a form of pesticide

**pyrethrins** naturally-occurring plant compounds having insecticidal properties

**pyrethroid** a synthetic organic compound with insecticidal properties similar to pyrethrins

**resmethrin** a synthetic pyrethroid pesticide used to eradicate adult mosquitoes in the home, lawn, garden and at industrial sites; active ingredient in the product Scourge®

**serologic** of, or relating to serum

**serum** liquid portion of the blood containing proteins, including antibodies

**vector** an organism (an insect in most cases) capable of carrying and transmitting a disease-causing agent from one host to another

**vector control** mechanism instituted to control and reduce the vector population

**vector surveillance** monitoring of the vector population for presence of a disease

**viral** of or relating to a virus

**viral encephalitis** inflammation of the brain caused by a virus

## Appendix B: Agency Duties and Contact List

### Bureau of Land Management

Jan Peterson, Safety/Occupational Health Manager
Idaho State Office1387 S. Vinnell Way
Boise, Idaho 83709
PH: 208-373-4030; FAX: 208-373-3805
Jan_Peterson@blm.gov

### Idaho Department of Environmental Quality

The Idaho Department of Environmental Quality (IDEQ) is responsible for protecting Idaho's drinking water quality, preserving Idaho's air quality, ensuring proper disposal of solid wastes, and remediation of releases of hazardous materials. The general number for IDEQ is 208-373-0502. See their website http://www.deq.state.id.us/ for additional contact information.

### Idaho Department of Fish and Game:

To discuss issues regarding mosquito abatement and IDFG lands, or West Nile virus in wildlife, contact Jeff Gould 334-2920.

#### Wildlife Diseases Laboratory

16569 S. 10th Ave
Caldwell IE 83605
208-454-7646

#### Idaho Conservation Data Center

For information regarding endangered species, please contact George Stephans, 208-334-3402

### Idaho State Department of Health and Welfare

#### Office of Epidemiology

450 W. State St., 4th Floor
Boise, ID 83720
208-334-5939

The Office of Epidemiology is responsible for tracking reportable diseases in Idaho. Disease due to West Nile virus and other arboviruses is reportable under these categories: aseptic or viral meningitis or encephalitis, and extraordinary occurrence of disease (*e.g.,* flaccid paralysis due to WNV.) A reported or suspected case of WNV disease will be investigated to determine the source of infection (when possible), to confirm laboratory findings, and to promote public health practices designed to reduce the opportunity for human illness. This may include the generation of educational press releases encouraging individuals to reduce mosquito habitats and mosquito biting opportunities around the home. The Office of Epidemiology will work closely

with district health departments. Additional activities include maintaining an educational website on WNV and working with other agencies involved with WNV, namely the ISDA and the IDFG.

**Bureau of Laboratories**

Virology Section
2220 Old Penitentiary Rd.
Boise, ID 83712

The state Bureau of Laboratories is capable of testing for the presence of WNV or antibodies against the virus in humans, horses, birds, and mosquitoes. Testing for this virus is a priority with rapid turn-around times and rapid reporting back to the submitting agency or physician.

**District Health Departments:**

District health departments provide public health services to all 44 counties in Idaho.

District 1: Panhandle Health District
Coeur d'Alene, ID
208-677-3481

District 2: North Central Health District
Lewiston, ID
208-799-3100

District 3: Southwest District Health Department
Caldwell, ID
208-455-5300

District 4: Central District Health Department
Boise, ID
208-375-5211

District 5: South Central Health District
Twin Falls, ID
208-734-5900

District 6: Southeastern Health District
Pocatello, ID
208-233-9080

District 7: District Seven Health Department
Idaho Falls, ID

208-522-0310

**Idaho State Department of Agriculture (ISDA)**

The roles of the Idaho State Department of Agriculture as related to animal disease tracking, the control of mosquitoes, and pesticide use include:

**Division of Animal Industries**

State Veterinarian, 208-332-8560

ISDA Animal Industries has the responsibility to address emerging animal diseases (such as West Nile virus). ISDA will continue to advise veterinarians and citizens statewide on the actions needed to address the WNV situation in domestic animals. Within the Division of Animal Industries, the Bureau of Animal Health and Livestock will track information related to reported horse cases and investigate suspicious cases in other animal species.

**Urban Pesticide Program**

Robert S. Hays, Coordinator; 208-442-2803

1. The authority to regulate pesticide usage in Idaho.
That authority includes the licensure of pesticide applicators, the registration of pesticide products used in Idaho, routine inspections related to pesticide use, and the investigation of pesticide related complaints. ISDA's Division of Agricultural Resources (DAR) conducts these activities as well as providing training for pesticide applicators.

2. Integrated pest management training and information.
DAR staff provides Idaho mosquito abatement districts and personnel with information and training related to integrated pest management techniques, pest monitoring/surveillance, pest management plan development, technical pesticide issues and pesticide regulation compliance.

3. ULV spray equipment calibration.
In an effort to maintain compliance with the pesticide label directions related to ultra low volume (ULV) droplet size, ISDA's Division of Animal Industries provides equipment and personnel for the calibration of ULV spray equipment used for adult mosquito control applications. This is a service based on request only and a fee is charged.

**Organic Program**

ISDA certifies organic producers. According to IDAPA 02.06.33.004, section 205.202 Land Requirements:

> *Any field or farm parcel from which harvested crops are intended to be sold, labeled, or represented as "organic," must: (b) Have no prohibited substances, as listed in 205.105* (i.e. synthetic substances, unless on allowed list, pesticides, fertilizers, prohibited

non-synthetic substances, sewage sludge) *applied to it for a period of 3 years immediately preceding harvest of the crop.*

A current list of certified organic growers for a given area may be obtained by contacting the ISDA at 208-332-8620.

**Apiary Program**

The ISDA's Apriary Program registers bee keepers operating in Idaho on a county-by-county basis. Please contact Mike Cooper, Acting Administrator, Division of Plant Industries, Idaho State Department of Agriculture at phone number 208-332-8620 for bee keeper contact information.

**Idaho Department of Water Resources**

The Idaho Department of Water Resources is responsible for water resource protection (*e.g.*, ground water protection, stream channel protection, flood plain management), water allocation (*e.g.*, water rights and distribution), and water planning (*e.g.*, minimum stream flows), among other duties. For issues involving mosquito abatement and WNV, contact Dick Larson, 208-327-7933

**Idaho Water Users Association**

The Idaho Water Users Association is organized to 'promote, aid and assist the development, control, conservation, preservation and utilization of the water resources of the State of Idaho and to cooperate with similar organizations in other states…" For issues regarding irrigation water, contact:
Norm Semanko, Executive Director
410 S. Orchard
Boise, Idaho 83705
208-344-6690
208-344-2744
iwua@iwua.org

**Mountain Home Air Force Base**

Conducts surveillance and coordinates control measures on the base.
Public Health Flight Commander
Mountain Home AFB, Idaho
Tel: 208-828-7385

**National Park Service**

To discuss pest management coordination with respect to National Parks, contact one of the following individuals:

Gerald McCrea
Regional Pest Management Coordinator
National Park Service, Intermountain Region
gerald_mccrea@nps.gov

PH: 505 988-6204  FAX: 505 988-6876

Erv Gasser
Regional Pest Management Coordinator
National Park Service, Pacific Region
erv_gasser@nps.gov

**U.S. Army Corps of Engineers**

For issues related to West Nile virus, contact:
Brayton P. Willis, Jr.
Boise Office, Walla Walla District
U.S. Army Corps of Engineers
P.O. Box 2780
Boise, Idaho 83701
PH: 208-345-2064  FAX: 208-345-2263
brayton.p.willis@usace.army.mil

For issues related to enforcement of wetlands protection under the Clean Water Act, contact Greg Martinez, 208-345-2155

**U.S. Fish and Wildlife Service**

To discuss mosquito abatement issues with respect to U.S. Fish and Wildlife Service lands, contact:
Sam Johnson, Region 1 Integrated Pest Management Coordinator
U.S. Fish and Wildlife Service
NWRS/OPR/Biology
9317 Highway 99, Suite D
Vancouver, WA 98665
PH: 360 696-7621; FAX 360-696-7968
E-mail: sam_johnson@fws.gov

**U.S. Forest Service**

To discuss mosquito abatement issues with respect to U.S. Forest Service lands, contact Janet A. Valle, 801-625-5258, jvalle@fs.fed.us

## Appendix C. DEQ aquatic pesticide application rule

**Idaho Administrative Code, Department of Environmental Quality
IDAPA 58.01.02 – Water Quality Standards and Wastewater Treatment Regulations follows. Please refer to section 080.**

## Appendix D. Larvicidal pesticides

Because of the nature of pesticide development and the annual registration of pesticides for distribution within Idaho, the following list of mosquito control products may or may not be current. When purchasing pesticide products, inquire if they are registered for sale in Idaho. You may also contact the Idaho State Department of Agriculture at 208-332-8610 to check the registration status of a pesticide.

## Larvicides

1. ***Bacillus thuringiensis israelensis*** (**BTI**)(*e.g*. Vectobac®, Teknar®, Mosquito Dunks®, Bti Tossits®)
   Use: Approved for most permanent and temporary bodies of water.
   Limitations: Only works on actively feeding stages (larval instar stages one, two and three). Does not persist well in the water column.
2. ***Bacillus sphaericus*** (*e.g.* Vectolex®)
   Use: Approved for most permanent and temporary bodies of water.
   Limitations: Only works on actively feeding stages. Does not work well on all species. May persist and have residual activity in some sites.
3. **IGRs** (Insect Growth Regulators)

   Methoprene (*e.g*. Altosid®)
   Use: Approved for most permanent and temporary bodies of water.
   Limitations: Works best on older instars. Some populations of mosquitoes may show some resistance.

   Diflurobenzamide (*e.g.* Dimilin®)
   Use: Impounded tailwater, sewage effluent, urban drains and catch basins.
   Limitations: Cannot be applied to wetlands, crops, or near estuaries.
4. **Larvaciding oils** (*e.g.* Golden Bear 1111®, BVA Chrysalin®)
   Use: Ditches, dairy lagoons, floodwater. Effective against all stages, including pupae.
   Limitations: Use of these products should be limited to areas that will not have run off or over flow out of treated area. Some plant damage has been observed from the use of larvacide oils (rice crops in California).5.
5. **Monomolecular Films** (*e.g.* Agnique MMF®)
   Use: Most standing water including certain crops.
   Limitations: Does not work well in areas with winds in excess of ten mph.
6. **Organo-phosphate based larvacides** (*e.g.* Abate®)
   Use: Breeding sites as specified on label directions.
   Limitations: Must be applied to areas with not run off or outflow, not selective, will kill other species besides mosquito larva.

7. **Pyrethrins** (*e.g.* Pyrenone Tossits®)
   Use: Breeding sites as specified on label, usually paired with pipernol butoxide as a synergist.
   Limitations: Must be applied to areas with not run off or outflow, not selective, will kill other species besides mosquito larva.

**Always read the label for safety considerations**
**and**
**follow the label directions for use.**

## Appendix E. Adulticidal pesticides

Because of the nature of pesticide development and the annual registration of pesticides for distribution within Idaho, the following list of mosquito control products may or may not be current. When purchasing pesticide products, inquire if they are registered for sale in Idaho. You may also contact the Idaho State Department of Agriculture at 208-332-8610 to check the registration status of a pesticide.

## Adulticides

1. **Organophosphate compounds**
   Note: Some mosquito populations may become resistant to label OP application rates is applications have been routine over several years. Recommend alternating or cycling adulticide products to avoid resistance development.

   Malathion (*e.g.* Fyfanon®)
   Use: May be applied by air or ground equipment over urban areas, and most crops, and wetlands when applied at labeled rates for public health applications.
   Limitations: May damage automobile paint if large droplets are produced; toxic to fish, wildlife and bees; crop residue limitations may resujlt in preharvest interval for some crops.

   Naled (*e.g.* Dibrom®, Trumpet EC®)
   Use: Air or ground application on fodder crops, swamps, floodwater, residential areas.
   Limitations: Same as malathion, and some cosmetic spotting of fruit may occur in dry hot climates.

2. **Pyrethrins** (natural pyrethrin products) (*e.g*. Pyrenone Mosquito Spray®, Pyrocide®)
   Use: Wetlands, floodwater, residential areas, some crops.
   Limitations: Do not apply to drinking water, milking areas; may be toxic to bees, fish, and some wildlife. Shellfish, such as crawdads, display little or no tolerance to these products. Some formulations with synergists have greater limitations.

3. **Pyrethroids** (synthetic pyrethrin products containing resmethrin, sumethrin, or permethrin) (*e.g.* Scourge®, Anvil®)
   Use: All non-crop areas including wetlands and floodwater.
   Limitations: May be toxic to bees, fish, and some wildlife; avoid treating food crops, drinking water or milk production.

**Always read the label for safety considerations**
**and**
**follow label directions for use.**

## Appendix F. Special training required prior to pesticide application

Depending on the type of business and the type of pesticide applied, two categories of pesticide applicator license are required.

To commercially apply pesticides for mosquito control or to apply a restricted use pesticide for adult mosquito control, one must be licensed in the "public health" and "law and safety" categories of the Idaho State Department of Agriculture pesticide applicator licensing program.

Currently there is no requirement for applicator licensing if the applications are of general use pesticides on land owned or controlled by the applicator or the applicator's employer. Some mosquito abatement districts require the manager to be a licensed professional pesticide applicator to demonstrate competency and as a condition of employment.

A public applicator license category is currently being considered by the ISDA to require licensure of all individuals that apply any pesticide to public property (schools, parks, public buildings), or private property (stores, restaurants, private institutions), open to public access.

**Public Health Pesticide Applicator Certification Training**

Idaho State Department of Agriculture, Sherman Takatori 208-332-8609
Certification and licensing is required for individuals wishing to apply restricted-use pesticides or apply pesticides commercially in the control of public health vectors. This training is three hours in length.

**General use pesticide application**

Information is available through the Idaho State Department of Agriculture Urban Pesticide Program**,** Robert Hays**,** 208-442-2803, related to the use of general use pesticides for mosquito control in situation not requiring pesticide applicator licensure.

For more general information on pesticides:

**American Mosquito Control Association**
**http://www.mosquito.org/**

**Northwest Mosquito and Vector Control Association**
**http://www.nwmvca.org/**

**Environmental Protection Agency**
**http://www.epa.gov/pesticides/**

## Appendix G. Example of a mosquito abatement district arbovirus emergency plan

Please click here for the Canyon County Mosquito Abatement District (CCMAD) Standard Operating Procedures for CCMAD Arbovirus Emergencies.